Virginia MEDICAL MONTHLY

OFFICIAL PUBLICATION OF THE MEDICAL SOCIETY OF VIRGINIA

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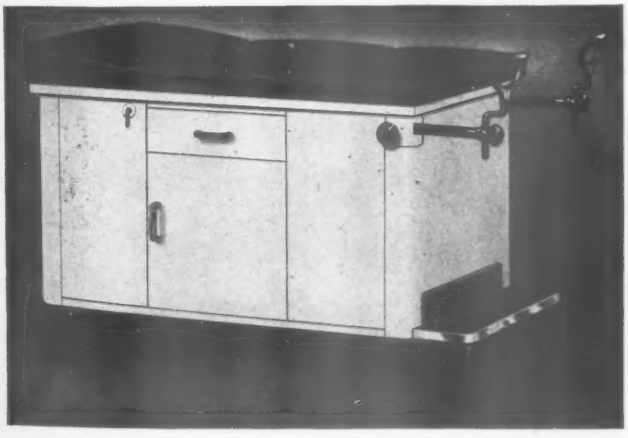

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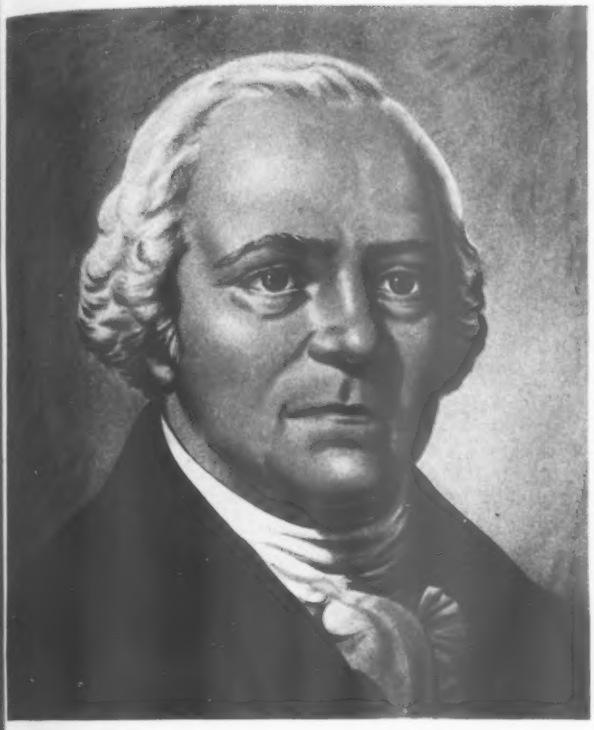

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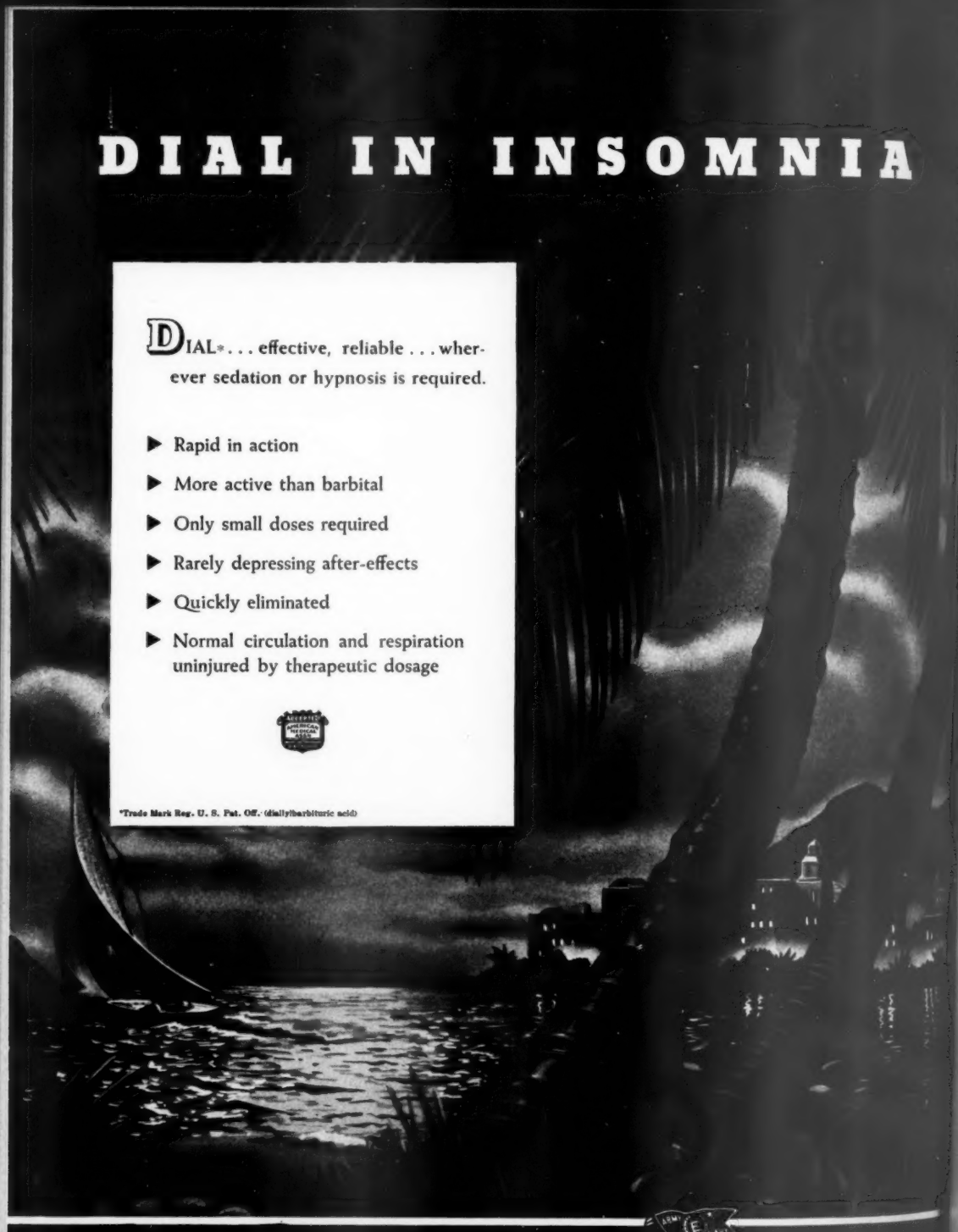
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(1) Am. J. Obst. & Gyn., 35:839, 1938. (2) West. J. Surg., Obst. & Gyn., 51:150, 1943. (3) Clin. Med. & Surg., 46:327, 1939. (4) Med. Rec., 155:316, 1942.

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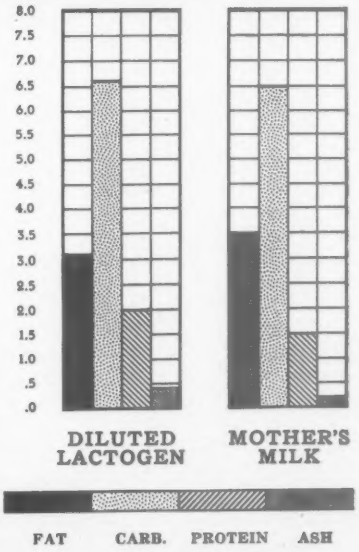

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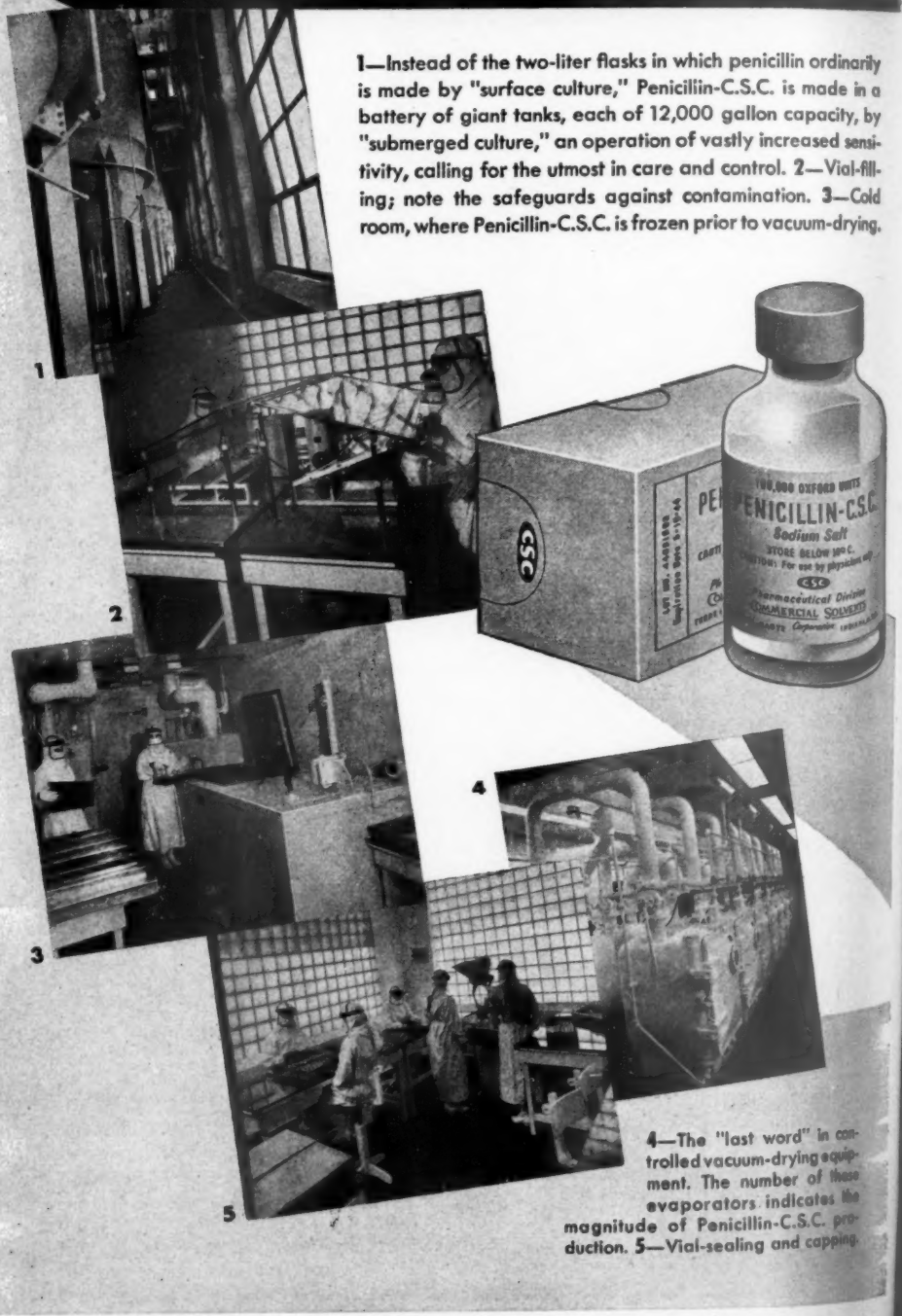

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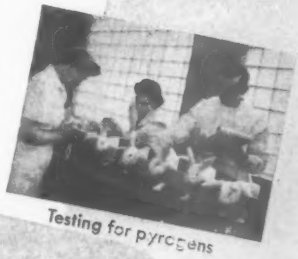

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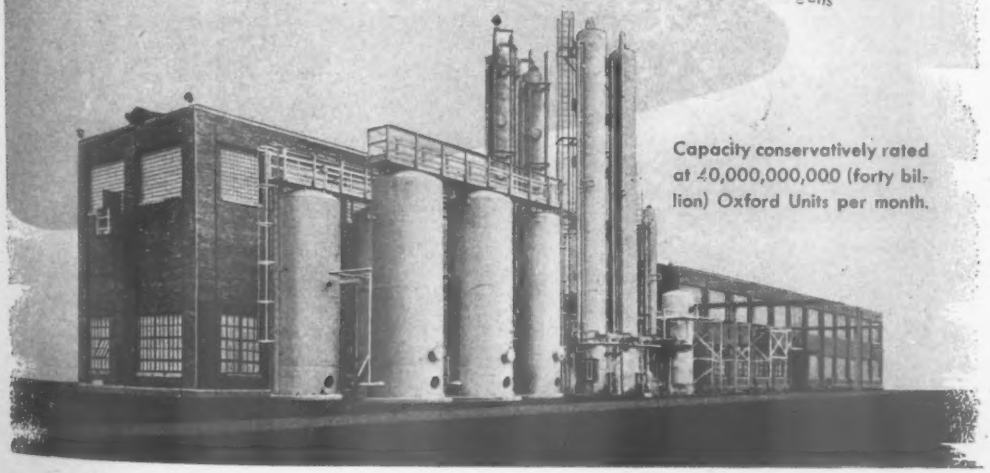

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Guest Editorial

Organized Medicine

FIFTEEN years as a member of the House of Delegates and eight years' service to my fellow physicians as a member of the Board of Trustees of the American Medical Association has given me an insight into some of the misunderstandings of the rank and file of the profession as to just what is the relationship of the parent body to State and County Societies.

It appears that the members are not informed as to just what is the function of the national organization. There is frequent criticism of the Board of Trustees and headquarters officers because of a failure to accomplish objectives which individuals think should be undertaken. This applies also to a criticism of the same groups because certain actions are taken.

The whole matter resolves itself into the fact that the individual members are uninformed as to what has been, or is being, accomplished. It seems to me that one of the most important undertakings for any State Medical Journal is to educate the membership as to just what "they" are doing, through the County and State Associations, in the national body.

The Board of Trustees of the American Medical Association includes nine members, two of whom are elected each year to serve for a term of five years. The Board meets regularly in September, November, February and June, and the Executive Committee of the Board meets monthly except for an occasional interval in the summer. By this system of meetings the Board is in constant contact with the headquarters office of the Association and with important changes that occur in relation to medical practice, federal legislation or other phases of life that might affect the American Medical Association.

A study of the annual reports of the Board of Trustees to the House of Delegates will indicate how the Board of Trustees has functioned in relationship to many matters of great importance to the medical profession. It will indicate also how great has been the trust of the House of Delegates in the Board of Trustees. Almost invariably when problems difficult of solution have arisen in the House of Delegates, the House has not hesitated to call on the Board of Trustees for solution and ultimate decision. Never is this done, however, except under a definite directive of the House of Delegates.

The American Medical Association since Pearl Harbor has been confronted with many problems of great importance to the future of American medicine. As an indication of the flexibility of the organization, the following groups have been established and have been functioning actively to meet critical situations:

1. The War Participation Committee. Long before the United States entered the war, the House of Delegates had established a Committee on Medical Preparedness which was concerned with the development of a complete roster of physicians with an indication of their willingness to serve in various capacities in the war effort. When the United States entered the war, this committee gave way to the War Participation

Committee which has met many times both in the headquarters office in Chicago and in Washington, D. C., where it has had contact with such agencies as the Procurement and Assignment Service for Physicians, Dentists and Veterinarians, the War Manpower Commission, the United States Public Health Service, and the Army and Navy Medical Departments. In its relationship to such agencies it has, for instance, established the policy that physicians are not to be sent into areas requiring medical care until there has been a call from the State Procurement and Assignment Service and the state medical society. This committee has been advisory in relationship to problems of medical education, or relocation of doctors to meet war needs, and of many similar problems.

2. THE COMMITTEE ON POSTWAR PLANNING. The minutes of the Committee on Postwar Planning have been published from time to time in *The Journal of the American Medical Association.* This committee has been especially concerned with meeting the needs of the medical profession in the postwar period. Thus there is contemplated a circularization of all doctors with the armed forces so that they may indicate their desires in relationship to the postwar period such as refresher courses, internship, residences, industrial practice, group practice, or other types of medical service.

This committee has been concerned also with meeting the need for graduate education on the part of physicians coming from other countries, especially those in South America. The committee is also concerned with the ultimate disposal of surplus medical supplies and is ready to act in an advisory capacity to various governmental agencies which wish the views of the medical profession on changes in the medical profession in the postwar period.

3. THE COUNCIL ON MEDICAL SERVICE AND PUBLIC RELATIONS. This council was created at the annual session of the House of Delegates in 1943. It has already published an analysis of the Wagner-Murray-Dingell bill and indicated its opposition to that type of legislation. It has also published a statement of policies indicating to some extent the manner in which the committee proposes to function. Arrangements have been made for the gathering of information concerning prospective legislation that may concern the medical profession and for utilization of various agencies in a wide dissemination to the public of the point of view of the medical profession.

4. Many bureaus of the American Medical Association, such as the Bureau of Health Education, the Bureau of Investigation, the Bureau of Legal Medicine and Medical Legislation and the Bureau of Medical Economics, report regularly to the Board of Trustees special problems that may arise in their functioning which have to do with the relationship of such bureaus to other agencies of the American Medical Association or to the medical profession as a whole.

The various Councils of the American Medical Association likewise bring to the Board of Trustees problems of this character.

As a member of the Board, I would pay special tribute to all of the physicians who throughout the years have given so freely of their time and of their service to the work of the American Medical Association, the House of Delegates and the various official bodies but especially to the members of the Board of Trustees who have year after year given unlimitedly of their time and of their thought and of their experience for the advancement of American medicine.

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A PRELIMINARY REPORT OF THE STUDY OF 200 AUTOPSY CASES AT THE EASTERN STATE HOSPITAL WITH SPECIAL EMPHASIS ON NEUROPATHOLOGY AND BRAIN TUMOR IN OLD AGE*

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A review of the literature for the past twelve years in both this country and in Europe failed to reveal any papers dealing with an analysis of the general pathological findings in autopsies performed in state mental hospitals. There have been a few reports devoted entirely to specific neuropathological findings and especially brain tumors in state hospitals as well as considerable literature with reference to constitutional studies in mental hospitals.

During the five year period 1937-1942, there have been 740 deaths at the Eastern State Hospital. 329 of the cases were autopsied, giving an average autopsy percentage of 45 per cent. The average patient population for the hospital during this period was approximately 1,840 patients.

Our report concerns itself with a preliminary study of 205 of our autopsy cases. In 200 of these cases, complete autopsies were performed, but only brain autopsies were allowed in the other five. The age incidence is given in Table I. It is obvious from this

TABLE I
AGE OF INCIDENCE

Years	No. of Cases
10-20	1
20-30	5
30-40	10
40-50	18
50-60	39
60-70	49
70-80	62
80-90	19
90-100	1
100-110	1
	205

table that this material is virtually geriatric in nature, inasmuch as 65 per cent of the cases were over 60 years of age at death (83 per cent over 50 years of age).

The clinical diagnoses are given in Table II. Here it is interesting to note that psychoses with

TABLE II
CLINICAL DIAGNOSES

	No. of Cases
PSYCHOSES WITH CEREBRAL ARTERIOSCLEROSIS	46
SENILE PSYCHOSES	43
DEMENTIA PRAECOX	30
MANIC DEPRESSIVE PSYCHOSES	26
PSYCHOSES WITH MENTAL DEFICIENCY	10
PSYCHOSES WITH SYPHILITIC MENINGO-ENCEPHALITIS (PARESIS)	8
WITHOUT PSYCHOSES	8
PSYCHOSES WITH OTHER SOMATIC DISEASE	7
UNDIAGNOSED PSYCHOSES	5
PSYCHOSES WITH EPIDEMIC ENCEPHALITIS	4
PSYCHOSES WITH OTHER DISTURBANCES OF CIRCULATION	3
INVOLUTIONAL PSYCHOSES	2
PSYCHOSES WITH CONVULSIVE DISORDERS	2
PSYCHOSES WITH OTHER FORMS OF SYPHILIS OF C. N. S.	2
PSYCHOSES ASSOCIATED WITH OTHER BRAIN OR NERVOUS DISEASES	2
PSYCHOSIS WITH OTHER INFECTIOUS DISEASES	1
PSYCHOSIS WITH INTRACRANIAL NEOPLASM	1
PSYCHOSIS WITH PELLAGRA	1
ALZHEIMER'S DISEASE	1
PICK'S DISEASE	1
ALCOHOLIC PSYCHOSIS	1
PSYCHOSIS DUE TO DRUGS	1

cerebral arteriosclerosis and senile psychoses contribute nearly one-half (43 per cent) of the total number of cases. If all of the organic reaction type of mental disorders in this study are added together, it is found that they contribute 70 per cent of the total number of cases. The so-called "functional psychoses", dementia praecox, and manic depressive psychosis make up only 27 per cent of the group. The incidence of the first ten psychoses given here in their order of frequency is very similar to the list recently compiled by Dayton[1] of first admissions to the Massachusetts Mental Hospitals when the admission rates are based on the age groups of the

*Read at meeting of Neuropsychiatric Society of Virginia, Richmond, February 16, 1943.
Awarded first prize given by the State Hospital Board for research in the Virginia State Mental Hospitals.
†From the Eastern State Hospital, Williamsburg, and the Medical College of Virginia, Richmond.
‡From the Medical College of Virginia Richmond.

population in which a given psychosis places 90 per cent or more of admissions. In this way the previously high incidence psychoses, dementia praecox and manic depressive psychosis, that is, when the figures are based on the total population, or all age groups, are now moved down to third and fourth places. When thus compared, there is a suggestive correlation between admission rates and mortality rates although it is realized that our group of cases is too small for these findings to be truly significant.

In Table III, the anatomical diagnoses (with the exception of neuropathological findings, are listed

TABLE III
ANATOMICAL DIAGNOSES

	No. of Diagnoses
BRONCHOPNEUMONIA	85
DIFFUSE SCARRING OF KIDNEYS	67
MYOCARDIAL SCARRING	64
MYOCARDIAL HYPERTROPHY	54
MODERATE AND SEVERE ARTERIOSCLEROTIC CHANGES OF AORTA	48
CORONARY SCLEROSIS	44
CYSTIC CHANGES OF KIDNEYS	33
CHOLELITHIASIS	27
PULMONARY TUBERCULOSIS WITH CAVITATION	23
PLEURAL EFFUSION	21
CIRRHOSIS OF LIVER	18
CORONARY OCCLUSION	17
PULMONARY EDEMA	15
PULMONARY CONGESTION	15
CYSTIC CHANGES OF THYROID GLAND	14
PROSTATIC HYPERTROPHY	14
DIVERTICULA OF LARGE INTESTINES	14
VALVULAR HEART DISEASE	13
ACTIVE PULMONARY TUBERCULOSIS WITHOUT CAVITATION	12
ULCERATION OF LARGE INTESTINES	12
ULCERATION OF SMALL INTESTINES	12
PULMONARY INFARCTION	11
CONGESTION OF LIVER	11
DIVERTICULA OF SMALL INTESTINES	11
NODULAR THYROID GLAND	10
DECUBITUS ULCERS	10

in their order of frequency. In this table only those lesions which were reported ten times or more are included. For the purpose of this report, only descriptive terms are used and no attempt has been made to subclassify the lesions in more detail. Bronchopneumonia was the terminal event in 85 instances. This was the most frequent lesion and reasonably so, inasmuch as the majority of mental diseases involved were chronic, progressive and debilitating processes such as occur especially in old individuals. It is also interesting to note that, with the exception of bronchopneumonia and some of the acute pulmonary edemas the lesions listed in Table III are all chronic processes. The high figures for cardiac, renal, and vascular lesions might justify the popular use of the all inclusive term "cardio-vascular-renal disease" for many such cases.

In Table IV the lesions which occurred less than ten times each are recorded. Here it is seen that

TABLE IV
ANATOMICAL DIAGNOSES

	No. of Diagnoses
RECENT MYOCARDIAL INFARCTION	9
ATROPHY OF TESTICLES	9
LOBAR PNEUMONIA	8
FIBROUS PLEURISY	8
PERICARDIAL EFFUSION	8
COLITIS	8
PERITONITIS	8
FIBROMYOMATA OF UTERUS	8
MEDULLARY DEGENERATION OF ADRENALS	8
PULMONARY ATELECTASIS	7
ASPIRATION OF FOREIGN MATERIAL IN LUNGS	7
HYPERTROPHY OF THYROID GLAND	6

OTHERS—Each occurring five times or less:

Pulmonary abscess	Metastatic malignancy of liver
Pulmonary embolism	Uterine malignancy
Empyema	Ovarian malignancy
Pericarditis	Gastric tuberculoma
Hemopericardium	Fibrosarcoma of pectoral muscle
Rupture of myocardium	Carcinoma of skin
Syphilitic aortitis	Cystitis
Aneurysm of aorta	Ruptured esophageal varix
Rupture of aortic aneurysm	Gastric ulcers
Rupture of aorta	Perforated gastric ulcer
Tuberculosis of spleen	Meckel's diverticulum
Tuberculosis of adrenals	Tuberculous peritonitis
Renal infarction	Gastric polyps
Hydronephrosis	Tuberculous pneumonia
Pyelonephritis	Suppurative pyelophlebitis
Renal Tuberculosis	
Papilloma of bladder	

lobar pneumonia occurred only eight times. The acute lesions with subsequent sudden death were very infrequent. Again, the low figures for these processes would be expected in the light of the age incidence of our material. The number of malignant tumors reported are small and most malignancies occurred only one time each. It is remarkable to note that gastric carcinoma did not occur in this series. Metastatic malignancy of the liver occurred three times.

In anticipation of the utilization of the autopsy material for studies in constitution, each autopsy was very carefully and completely performed with rather detailed protocols. Unless exact measurements and

weights of organs are recorded, studies in constitution would be fruitless. In this preliminary report, we do not wish to present in any detail the constitutional implications of this series of cases, but it might be of some interest to illustrate by a table of heart weights an example of some of the constitutional tendencies. Lewis[2,3,4] has for many years been studying in great detail the anatomical findings in dementia praecox and paranoid developments as well as in the manic depressive group of psychoses. He has been able to show that if the dementia praecox group is separated into a nuclear and peripheral type, that is, if the hebephrenic-catatonic types are separated from the paranoid types, a striking correlation exists between morphological findings and mental mechanisms. He has postulated two large groups, a regressive group and a hypercompensatory or progressive group. In the regressive group have been placed the hebephrenic and catatonic dementia praecox and in the hypercompensatory or progressive group the paranoid developments, including paranoid dementia praecox and manic depressive psychoses.

In the regressive group, one finds, among other pathological changes, a hypoplasia of the circulatory system with a small heart and a small thin aorta, as contrasted with the compensatory findings of a large hypertrophied heart and arteriosclerotic changes in the hypercompensatory or progressive group. Table V and V-a illustrates this variation in heart weights. If 300 grams is taken as the average heart weight, one notices that most of the weights given for the hebephrenic-catatonic dementia praecox group fall below this figure and the weights given for the paranoid dementia praecox and manic depressive group are higher than this figure. Lewis[4] reported a degree of vascular hypoplasia and some widening of lymph channels in 85 per cent of the hebephrenic-catatonic form of psychoses. More detailed analysis of our material with reference to constitution will be reported in future communications.

In Table VI the neuropathological findings are

TABLE V

Heart Weights—Grams				Heart Weights—Grams			
Name Males	D.P. Heb.-Cat.	D.P. Paranoid	Manic Depressive	Name Females	D.P. Heb.-Cat.	D.P. Paranoid	Manic Depressive
H.S.B.		330		N.L.B.			340
O.B.	300			D.B.		540	
A.B.		390		E.E.D.			600
H.E.C.		300		D.A.E.			520
W.E.C.	200			R.V.E.		200	
A.P.F.		360		A.E.	280		
R.H.			320	M.J.F.			400
R.H.P.			440	V.M.G.	160		
V.J.R.		520		M.M.		360	
L.S.R.			380	S.P.			500
R.F.S.			350	E.M.P.	180		
L.E.T.			360	N.S.	280		
P.G.W.		540		J.L.S.	108		
S.M.W.		370		O.J.W.	320		
F.J.H.			560	C.B.H.	240		
E.M.M.		350		N.P.			340
W.J.R.	240			C.W.		500	
A.L.W.			460	E.D.	300		
J.A.B.			600	R.M.	240		
J.W.I.		540		M.B.			220
A.K.			440	B.S.	240		
E.N.P.			310				
W.L.G.	300						
C.A.S.		680					
J.T.	260						
W.R.W.	275						

TABLE V-A

A PRELIMINARY STUDY IN CONSTITUTION

	Regressive Group*	Hypercompensatory (Progressive) Group*	
Mental Diagnosis	Hebephrenic—Catatonic	Dementia Praecox Paranoid	Manic Depressive Psychosis
No. of Cases (Male and Female)	16	14	17
Average Heart Weight (grams of the above cases.)	248 grams	419 grams	420 grams
Average Heart Weight in normal individuals (after Roessle and Roulett) Male ..... 316 Female .. 270 Average 293 grams	293 grams	293 grams	293 grams
Difference between average weight of hearts in above cases and normal individual	—47	+116	+117

*Classification of N.D.C. Lewis

presented. In biology, tables and statistics have their weak points and so have our tables. It is obvious that the classification of neuropathological findings according to their "essential" or "accompanying" character implied an arbitrary factor. This factor is always involved when a decision must be made with regard to the role a given lesion may play in the entire pathological picture. This arbitrary factor cannot be avoided. In the very few instances in which only a single neuropathological finding was present, this single finding was classified as "essential". We tried to use as many descriptive terms as possible. We feel that it is the primary task of the psychiatrist or neuropathologist dissecting a brain to give a pure description of what he sees. (However, a preliminary "impression" of the nature of the lesions found and an attempt to correlate the neuropathological findings with the clinical picture was made in every case.) The neuropathological report will thus never lose its value and will never be invalidated by further microscopical examinations. Although the various neuropathological findings listed in Table VI may occur in all age groups, by far the most frequent lesions reported are those found in senile brains. The number of cases wrongly contributing to this impression is extremely small as proven by microscopical studies.

TABLE VI

NEUROPATHOLOGICAL FINDINGS

TYPES OF LESION	ESSENTIAL	ACCOMPANYING	TOTAL
ARTERIOSCLEROSIS OF BASAL VESSELS (DILATATION, RIGIDITY, TORTUOSITY, CALCIFICATION, PLAQUES, THICKENING)	22	99	121
ENLARGEMENT OF THE VENTRICULAR SYSTEM, HYDROCEPHALUS INTERNUS	9	95	104
CONVOLUTIONAL ATROPHY	64	38	102
SOFTENING	54	23	77
FIBROSIS OF PIA MATER	4	59	63
ENLARGEMENT OF PERIVASCULAR SPACES, LACUNAR STATE, CRIBIFORM STATE	9	42	51
DEGENERATION OF CHOROID PLEXUS	7	33	40
CONGESTION OF PIA MATER	1	14	15
CEREBRAL HEMORRHAGE	7	4	11
OTHERS	4	6	10
NO LESIONS	--	--	9
NEOPLASM	8	2	10
ASYMMETRY OF HEMISPHERES (SIZE CONVOLUTIONAL PATTERN)	1	5	6
CEREBELLAR HEMORRHAGE	1	1	2
MEGALOENCEPHALY	3	--	3
PACHYMENINGITIS HEMORRHAGICA INTERNA	1	2	3
SUBDURAL HEMORRHAGE	--	2	2
STATUS VERRUCOSUS, SCHIZOGYRY	3	--	3
PACHYMENINGITIS OSSIFICANS	--	2	2
SUBARACHNOID HEMORRHAGE	--	1	1

There were only 9 cases among 205 in which no lesions could be seen. The usefulness of neuropathology in State Hospitals cannot be illustrated in a more eloquent manner.

The table of the neuropathological findings is again the exact counterpart of the table of age inci-

dence. Indeed, the highest figure of neuropathological findings occurs in arteriosclerotic changes of the cerebral vessels, enlargement of the ventricular system, hydrocephalus internus, convolutional atrophy, and fibrosis of the pia mater. These various lesions represent the main components of the aged brain. In this respect, the high percentage of degeneration of choroid plexus should be noted.

The relatively small number of cerebral hemorrhages is interesting, especially when compared with the high figure of vascular disorders on arteriosclerotic basis and the relatively large number of softenings. The latter fact is in conformity with recent statements made by D. Rothschild.[5]

In spite of the fact that the various components of the senile brain are the most frequent findings, there are numerous other lesions which could have been found in material of any age and which thus leads to the conclusion, that *old age, although it usually gives rise to an "old" brain, may show any conceivable lesion.* In this respect, the high figure of neoplasms (4.9 per cent) is very remarkable. This figure is not much lower than that noted for cerebral hemorrhages, which are generally considered as characteristic of old age.

Other reports of the incidence of brain tumors occurring in autopsies performed in state mental hospitals vary from .3 per cent to 3.4 per cent (Davidoff and Ferraro[6], and J. L. Hoffman[7]). Larson[8] reported an incidence of 13.5 per cent intracranial tumors in 229 autopsies performed at Western Washington State Hospital. His figures, however, are exceptionally high and he included cerebral aneurysm in the category of brain tumor.

Special attention has been given to our tumor group. There were 10 neoplasms among 205 autopsies. Seven of these neoplasms occurred in patients past fifty. Four of the seven cases were 64, 70, 71, 76 years, respectively.

Histopathological examination revealed:

3 glioblastoma multiforme
3 tuberculomas
1 spongioneuroblastoma
1 meningioma
1 adenoma of the pituitary (chromophobe)
1 unclassified tumor

There can be no doubt that tumor research in old age faces problems of great importance and general interest. This conclusion may also be drawn from previous invsetigations, the number of which is extremely small (Moersch, McK. Craig and Kernohan[9], Moore[10], McIntyre and McIntyre[11]). By an individual analysis of 3 instructive cases we intend to display the problems involved rather than to solve them.

Case I (A.B.). The patient, a male schizophrenic, was in the Eastern State Hospital for 28 years; at the age of 57, he suddenly fell. Following this fall numerous symptoms were noted, such as unsteady gait, general increased incoordination, slight generalized tremor, convulsive seizures of Jacksonian character suggesting a lesion of the left hemisphere, slight right facial weakness, paralysis of the right arm and leg, absence of abdominal and cremasteric reflexes. Disc margins on right were very indistinct with hemorrhagic areas at superior nasal margin of disc. About 12 days after the onset of these symptoms the patient died. Neuropathological examination (Fig. 1) revealed a bilateral glioblastoma multiforme affecting both hemispheres, but predominantly the left one and involving the centrum ovale, anterior and superior regions of the striatum, internal capsule, corpus callosum, and reaching as far backward as the posterior horns of the lateral ventricles, but sparing the cortex.

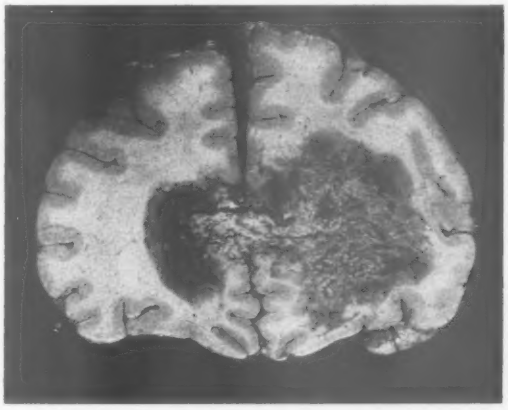

Fig. 1. Glioblastoma Multiforme—Gross Appearance.

Case II (R.N.). At the age of 64, this male patient began to lose his memory, acted foolishly and flightily, wandered around the country and was unable to find his way home. He became easily excited and more and more helpless. The clinical picture was that of a senile psychosis and of a slow and progressive mental deterioration. There were no strokes. Duration of clinical symptoms: 3 years.

Neuropathological examination revealed a spongioneuroblastoma (Fig 2) involving the right frontal and parietal lobes, the white matter, striatum and internal capsule, but the cortex only to a small extent. The anterior regions of the neoplasm were hemorrhagic in character and encapsulated, the posterior regions affecting an infiltrative mode of growth.

Case III (W.E.A.). The patient was 71 years of age at the time of his admission to the Eastern State Hospital. He had not worked for the past two years because of general enfeeblement as a result of old age. About two months before admission the patient was suddenly taken ill with an attack of unconsciousness. According to his son, the patient had been gradually deteriorating since that time. He had been difficult to handle, mildly violent, refused to keep clothed and attempted to leave the house and wander about on many occasions and there was definite irra-

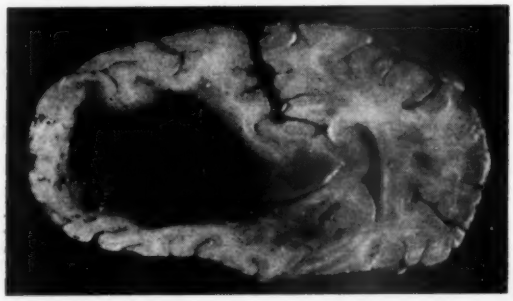

Fig. 2. Spongioneuroblastoma—Gross Appearance.

tional conduct and memory loss. Because the patient seemed to be getting worse, refused to take nourishment and was apparently paralyzed on the right side, he was taken to a Richmond Hospital where a diagnosis of cerebral vascular accident and cerebral thrombosis was made. He was later committed to the Eastern State Hospital. Neurological examination at the Eastern State Hospital revealed generalized rigidities, generalized fibrillary twitchings of the muscles, generalized hyperflexia and bilateral ankle clonus. He died 10 days after admission. Neuropathological examination (Fig. 3) revealed a very extensive, unusual (unclassified disseminated tumor, involving both hemispheres and the cerebellum. The various nodules were of different sizes and ages, they involved both the white and underlying gray matter and were placed more in the periphery than in the center (Fig. 4). Several tumors had been transformed into hemorrhagic cysts, others appeared to be softened. The constituent tumor cell was similar to an unripened nerve cell (Fig. 5).*

The following preliminary conclusions may be drawn from these (and similar) cases:

Fig. 3. Gross Appearance of Disseminated Tumor.

1. *In an aged patient the clinical history of objective tumor symptoms may be unusually short,* in spite of the fact that at the time of the onset of tumor symptoms the growth may be very extensive or even disseminated and not at all limited to a so-called silent area. (The clinical history in case I was 12 days; 2 months in case III. The average survival

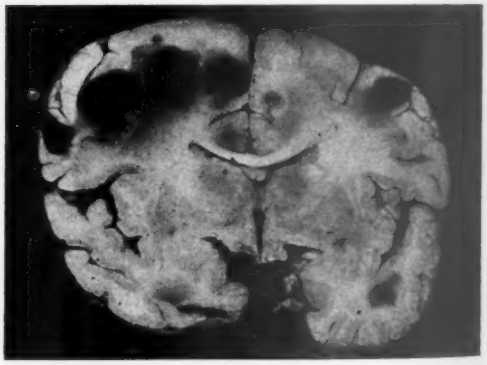

Fig. 4. Gross Appearance of Disseminated Tumor Showing Peripheral Distribution of Nodules.

period in a similar group reported by Davidoff and Ferraro was 9.1 months.) Thus, the aged brain does not always react to a new pathological condition in the same way as a young brain, the reaction type of the aged brain being less violent and slower.

*This case has been studied completely and will be published in the *American Journal of Psychiatry.*

2. *The number of classical tumor symptoms may be small or even entirely lacking in an old brain.* The diagnosis of brain tumor in old age is therefore an even more difficult task than in earlier life periods. The relative frequency of unsuspected neoplasms in old people makes it important to attempt to rule out brain tumor in each case, although this is frequently impossible.

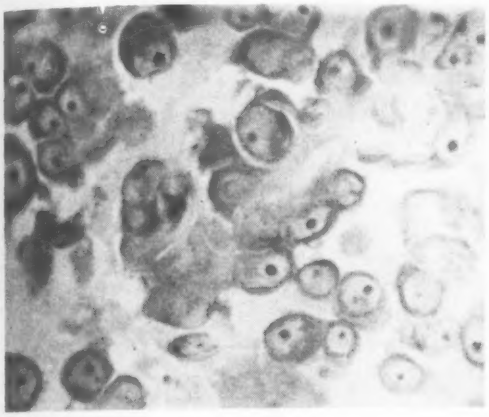

Fig. 5. Cellular Structure of the Constituent Elements of a Nodule. Nissl X450.

3. *The symptomatology of brain tumor in old age may lose much of its specific character* and become similar to other neurological or psychotic conditions of the same life period, such as vascular accidents, psychosis with cerebral arteriosclerosis, or senile dementia. It seems that the *various life periods have their own physiological and pathological reaction types* and that an old brain has the tendency of reacting in its own way whatever the pathological condition may be. Generally speaking, *neuropathology must be written not only in terms of structural elements but also in terms of life periods.*

We intend to report more completely our studies of the problems of brain tumor in old age in psychiatric patients in the near future.

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Student Enrollments in Nursing Schools.

A total of 112,249 student nurses were enrolled in the 1,307 state accredited schools of nursing in the country on January 1, 1944, an increase of nearly 12,000 over the number enrolled in 1943 and more than 20,000 over 1942, according to a study just completed by the Department of Studies of the National League of Nursing Education and reported in the May 1944 *American Journal of Nursing.*

Although the number of state accredited nursing schools has decreased from 1,472 in 1935 to 1,307 in 1944, the size of the average school has steadily grown. In 1935 the average school had 48 students; in 1944 it has 86, an increase of 79 per cent.

FEMORAL VEIN LIGATION IN THE TREATMENT OF PULMONARY EMBOLISM DUE TO FEMORAL THROMBOPHLEBITIS*

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Pulmonary embolism is an all too frequent cause of dramatic and sudden death in both medical and surgical patients. In practically all instances, the cause is thrombophlebitis in the lower extremity. Recently, from Boston, there has been published a series of articles claiming that thrombophlebitis in the lower extremities is initiated in about 85 per cent of cases below the profunda femoris and usually in the deep veins of the calf, and that pulmonary embolism can and should be prevented in such instances by ligation of the femoral vein, proximal to the thrombophlebitic process. It is the purpose of this paper to emphasize these conceptions and to report my experiences with femoral ligation in three cases. Technical details as learned from these three cases and from cadaver dissection are also described.

For many years, masterful inactivity has been the keynote of the therapy of thrombophlebitis. We apply hot compresses and an electric cradle, order all concerned to move the patient's extremity as little as possible and pray that embolism will not occur. Treatment of the ilio-femoral variety has been improved by the early employment of paravertebral lumbar sympathetic block. Pain is immediately relieved, the swelling rapidly disappears, and the fever quickly subsides. Spinal or caudal anesthesia has the same effect and already favorable reports are coming out on the use of continuous caudal anesthesia instead of paravertebral block. Heparin and dicoumarin have also been added to our armamentarium for the therapy of thrombophlebitis. Their value has not been definitely established at this writing. An outstanding fact is that these more modern methods of treatment have not lessened the incidence of pulmonary embolism.

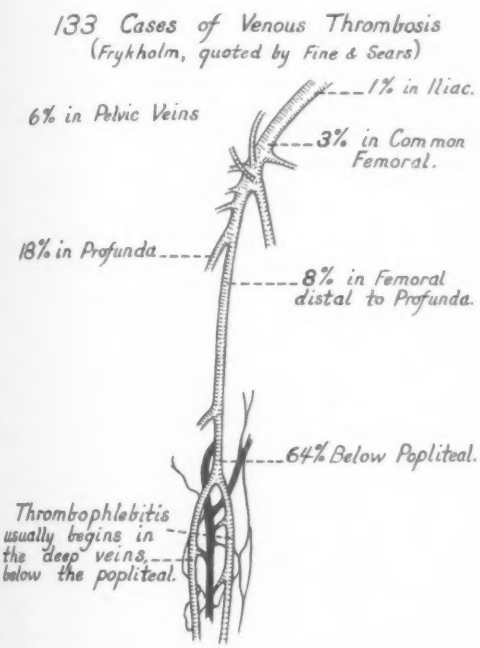
I shall not attempt to review the impressive literature that tends to substantiate the claim of the Boston men, that thrombophlebitis in the femoral vein is usually initiated in the deep veins of the calf. Once one becomes cognizant of the fact that the calf, and not the groin, is the usual site of origin of lower leg thrombophlebitis, and is on the alert for the process clinically, the syndrome will be encountered with remarkable frequency. There is an insidious onset with a slight rise in temperature and pain in the leg usually in the calf region, occasionally in the heel or sole of the foot. The pain may be so slight that it is not mentioned by the patient until specifically questioned about it. Almost invariably there is tenderness of the calf muscles and forceful dorsi-flexion of the foot causes pain in the calf or popliteal region—"Homans' sign". There may be slight edema of the lower leg, increased local heat, fulness of the superficial veins, slight cyanosis, elevated sedimentation rate. In the average case, the process subsides in several days. In some instances, pain develops in the groin, indicating extension of the phlebitis to the femoral or iliac vein. On the other hand, the first warning that thrombophlebitis exists may be the sudden occurrence of pulmonary embolism.

According to Fine *et al,* approximately one out of every seventeen to twenty persons with clinically recognizable thrombophlebitis of the deep veins of the lower extremity will die of embolism. Likewise, one person of every six to twelve who have survived one or more attacks of pulmonary embolism, will die of a subsequent embolus. In patients over fifty years of age, have deep thrombophlebitis, Welch *et al* had a death rate of 8 per cent from massive pulmonary infarction. In a statistical study of eight hundred and ninety-nine cases of fatal and non-fatal embolism, Barker *et al* reached the conclusion that, if all fatal embolisms which were preceded by a clinically diagnosed non-fatal embolism could be prevented, the total number of fatal embolisms would be reduced by one-third.

It is apparent that disastrous consequences are to be expected from failure to intervene when thrombosis in the deep veins of the lower leg is known to exist and that even if operative intervention is limited to those cases in which an embolism has already occurred, the death rate may be reduced by one-third.

*Read before the annual meeting of the Medical Society of Virginia, at Roanoke, October 25-27, 1943.

Homans was the first to recommend ligation and division of the femoral vein proximal to the thrombophlebitic process to prevent pulmonary embolism. Other Bostonians, Fine and Sears, Fine, Frank and Starr, of the Department of Surgery, Beth Israel

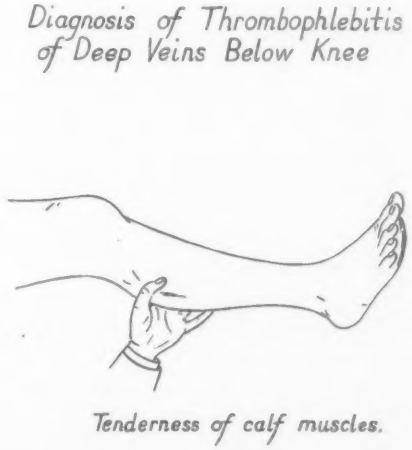

133 Cases of Venous Thrombosis
(Frykholm, quoted by Fine & Sears)
1% in Iliac.
6% in Pelvic Veins
3% in Common Femoral.
18% in Profunda
8% in Femoral distal to Profunda.
64% Below Popliteal.
Thrombophlebitis usually begins in the deep veins below the popliteal.

Hospital and Harvard Medical School, and Welch, Faxon and McGahey of the Massachusetts General Hospital have further explored the problems involved, and practiced the procedure extensively.

Venography, as introduced by Dos Santos in 1938, and applied to the thromboembolic problem by Bauer, has been of material aid to those interested in the prevention of pulmonary embolism. Bauer obtained his venograms by injecting the radiopaque solution into a terminal branch of the lesser saphenous, cutting down on the vein just behind the external malleolus. The Boston group has employed a simpler method: 25 cubic centimeters of diatrast are injected into one of the dorsal veins of the foot or the distal end of the long saphenous, while return of blood through the long saphenous is prevented by a blood pressure cuff applied around the calf and inflated to 20 to 40 millimeters of mercury pressure. All of the injected diatrast is thus shunted through the perforating veins into the deep venous system. The patient's heel is elevated on a four inch block and the leg is rotated inward 10° to 15° to secure the widest gap between the tibia and fibula. Sixty seconds are used to inject the solution, and immediate x-ray exposures are made, using soft tissue technique. A normal venogram will show numerous branches in the lower leg, the anterior and posterior tibial and peroneal, the popliteal and the femoral veins. A variation of the above technique is the injection of the contrast solution into the long saphenous in the thigh. The upper femoral and the iliac veins are visualized if the thrombotic process has not extended up to this level.

The status of venography in thrombophlebitis has not been entirely settled The contrast media has occasionally aggravated the inflammatory process. Certainly, in the absence of clinical evidence of the origin of the clot, a venogram should be made if pulmonary embolism has occurred, for a latent thrombophlebitic process may only thus be diagnosed. Likewise, if surgical intervention has been decided upon, the venogram will demonstrate the upper limit of the thrombosis and indicate where ligation must be performed to be ahead of the process.

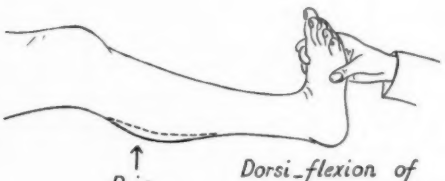
According to Welch *et al*, the femoral vein is ligated in any case of deep thrombophlebitis, if the patient is forty years of age or over, or if he is under forty and has a bland thrombosis, or has had a pulmonary embolism. Welch's report includes over



one hundred phlebograms and eighty-two femoral vein ligations for deep venous thrombosis. It is the policy of Fine, Frank *et al* always to divide the femoral vein if signs and symptoms of thrombophlebitis in the lower leg exist, or if a filling defect is

demonstrable in the venogram. These authors feel that routine division of the common femoral vein is the procedure of choice, and state, further, that deliberate failure to do so in any given instance is equivalent to deliberate acceptance of the risk of

Diagnosis of Thrombophlebitis of Deep Veins Below Knee (Homans' Test)



embolism, in preference to the risk of division of the common femoral vein.

If the thrombotic process has extended to the upper part of the common femoral or into the iliac vein, a retroperitoneal abdominal operation is required. Routine surgical interference has not been recommended in such cases, as the risk involved may be greater than warranted. However, should pulmonary embolism occur, there should be no hesitancy in ligating the external or the common iliac and, according to Homans, this procedure will cause even less interference with the venous circulation than ligation lower down, due to better collateral circulation.

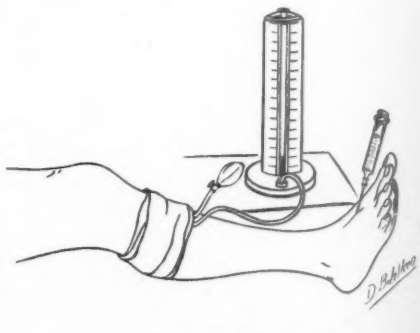
The Boston surgeons carried out their policy of routine femoral vein ligation in cases of deep venous thrombosis of the legs that occurred in victims of the Cocoanut Grove fire disaster. Moore, of Massachusetts General Hospital, has reported four of these cases. Pulmonary infarction had preceded the femoral ligation in two of the cases reported.

Before presenting my own cases of femoral vein ligation for the prevention of pulmonary embolism, I shall describe two instances in which ligation was not performed—with fatal consequences.

Case I.—B. M., Norfolk General Hospital, No. 7128, age 28, had a supravaginal hysterectomy and right salpingo-oophorectomy on August 28, 1942. On the twelfth postoperative day, the patient suddenly complained of pain in the left chest, worse on breathing. A roentgenogram taken the same day showed patchy areas of consolidation in the left lung which were interpreted as multiple small emboli. There were no signs of thrombophlebitis in either groin and the pelvic veins were thought to be the source of the emboli. Three days later, the typical findings of ilio-femoral thrombosis were present. Emboli continued to occur and the patient's condition became critical. Heparin therapy was instituted and was maintained until the patient's sudden death from another embolic episode three days later. At autopsy, the left iliac vein contained a grayish-white and reddish clot which extended almost to the vena cava. The clot could be traced down the femoral wall into the lower thigh. The right femoral and pelvic veins were normal. The lungs showed multiple areas of pulmonary infarction.

Comment: Pulmonary embolism in this case was the first indication that thrombophlebitis existed. It is to be presumed that if we had been familiar with the syndrome of lower leg thrombophlebitis and had examined the calf region properly, evidence of thrombophlebitis in the deep veins of the calf would have been apparent several days before the typical signs of "milk leg" developed. Certainly, in light of our present knowledge, venograms of the lower extremities should have been taken as an

Technique of Venography



25 C.C. of Diatrast injected.

emergency procedure as soon as evidence of pulmonary embolism existed. Heparin might have been expected to prevent further thrombosis, but it could not and did not prevent the breaking loose of clots and repeated embolic episodes. Iliac vein liga-

tion would have been hazardous, as the patient was very ill, but it probably could have been performed and the patient's life might have been saved if we had been more courageous.

Case II.—G. A., Norfolk General Hospital, No. 7201, a forty-three year old woman, had a supravaginal hysterectomy and left salpingo-oophorectomy performed for a fibroid uterus and pyosalpinx. On the ninth postoperative day, a rise of temperature occurred and physical signs interpreted as those of bilateral bronchopneumonia were noted. Three days later, a patch of thrombophlebitis was observed in a small superficial vein, on the inner surface of the lower leg. That afternoon the patient suddenly died, evidently of pulmonary embolism.

Comment: It is now known that deep vein thrombophlebitis often coexists with a superficial thrombophlebitis. The source of the thrombus was probably a process in the deep veins of the calf. A superficial thrombophlebitis, certainly in a non-varicosed vein, calls for a venogram of the deep venous system.

Case III.—P. H., Norfolk General Hospital, No. 9674, a twenty-six year old man, had a left nephrectomy performed November 20, 1942, for pyonephrosis. On the seventh postoperative day, the patient complained of pain in the calf of the right leg and to a lesser extent in the right groin. The temperature rose to 102° F. and the pulse rate to 100. There was tenderness in the calf and groin and Homans' sign was positive. A diagnosis of thrombophlebitis of the deep veins of the calf with upward extension was made. Routine management was ordered plus the immersion of both arms in hot water for an hour three times a day. I have often used this procedure effectively when lumbar sympathetic block is refused, obtaining similar though less pronounced vasodilatation in the lower extremities. The patient improved progressively and he was discharged from the hospital December 12, fifteen days after the onset of his thrombophlebitis, with normal temperature, pulse and sedimentation rate. During his second night at home, the patient was taken suddenly with sharp pains in his right chest behind his shoulder, marked shortness of breath, cough and hemoptysis. He was rehospitalized, placed in an oxygen tent and given sulfadiazine to prevent infection in the infarcted area. Although all signs of thrombophlebitis in the right leg had disappeared, and the left leg was entirely negative, exploration of the right femoral vein was thought advisable and was proposed to the patient. This, the patient refused in spite of a careful explanation of the risk he accepted of having further emboli. The lung signs rapidly cleared, and, on December 24, the patient again left the hospital, having given no evidence of further emboli or of active thrombophlebitis in either lower extremity. On January 7, 1943, two weeks after his last discharge from the hospital, and forty-one days after the onset of his "milk leg", the patient again was taken suddenly with right chest pain and dyspnea. He was again hospitalized, with clinical signs of pulmonary embolism and this time he consented to a femoral vein ligation provided an "x-ray" showed it necessary. A venogram, taken by the method previously described, was reported as follows: "Marked filling defects in the femoral vein. The defects do not extend as high as the foramen ovalis. The findings are consistent with thrombosis of the femoral vein. As best I can tell, the superficial and profunda veins are unobstructed."

Operation was performed on January 14, 1943, under local anesthesia through a vertical incision beginning just below the crease in the groin. With the pulsation of the femoral artery as a guide, the dissection was deepened through Camper's fascia and the fascia lata to the vascular sheath. The sheath was opened just over the artery and then over the vein, which was found on the inner side of the artery. The femoral vein was freed within the sheath, from just below the femoro-saphenous juncture to beyond the entrance of the profunda femoris. This branch entered the femoral directly posteriorly. It seemed entirely normal as did the femoral just below it. A nick in the femoral resulted in the free flow of blood, further indicating its freedom from thrombosis at this level. Accordingly, the femoral was divided between double ligatures of chromic catgut No. 2 just below the entrance of the profunda. The saphenous vein, which had been traumatized during the dissection, was likewise ligated and divided.

Convalescence from this operation was unusually smooth and the patient left the hospital on the sixth postoperative day. He experienced no further setbacks and has been working hard as a machinist. There is a tendency to moderate swelling of the

right leg, which he controls with an elastic bandage.

Comment: Recalling Fine's statement that one person of every six to twelve who have survived one or more attacks of pulmonary embolism will die of a subsequent embolus, femoral vein ligation in this case certainly was indicated and may have been life-saving. The findings at operation bore out the venography findings that the profunda femoris and common femoral were normal and that the lower femoral was the site of origin of the emboli.

Case IV.—A. R., Norfolk General Hospital, No. 4697, age thirty-five, had a supravaginal hysterectomy and right salpingo-oophorectomy performed on June 4, 1943. On the tenth postoperative day, a slight elevation of temperature occurred. Two days later, the patient complained of pain in the left lower leg and lower thigh. The left lower leg was slightly swollen, the calf was tender and Homans' sign was positive. A venogram on June 16 was reported as follows: "The superficial system is well-filled. The point of juncture of the saphenous with the femoral is well demonstrated and there is considerable reflux into the femoral and femoral profunda. Neither the tibial nor the peroneal is filled. The findings are consistent with obstruction of the deep venous system of the lower leg." On June 19, the day following paravertebral novocaine injection of the lumbar sympathetic for increasing pain in the leg incident to the taking of the venogram, the patient experienced sudden pain in the left chest, dyspnea, and cough. The clinical findings were those of pulmonary embolism, and femoral vein ligation was performed as an emergency procedure.

Spinal anesthesia was used and a "T" shaped incision was made, with the horizontal limb parallel and just below the crease in the groin and the vertical portion over the femoral artery pulsation. The saphenous vein was retracted and the fascia lata incised. The femoral sheath was found with difficulty and after considerable loss of time, as no femoral pulsation could be detected in the operative area. When the vascular bundle was found and the sheath was opened, a contracted and non-pulsatile femoral artery was found resting squarely in front of the enlarged and thrombosed femoral vein. The artery was with difficulty dissected from the vein, and thereafter was observed to have a faint but definite pulsation. With the femoral artery retracted laterally, the femoral vein was freed within its sheath up to the femoro-saphenous point. Dissection was then begun of the common femoral above the femoro-saphenous junction. The femoral was obviously thrombosed throughout the entire extent of the dissection, both below and above the saphenous. As it thus was impossible to get above the thrombotic process without a laparotomy, the femoral vein was divided between double ligatures just below the saphenous junction. A red clot partially occluded the lumen of the divided vein. The wound was closed with a few interrupted stitches in the fascia lata and a continuous dermal suture in the skin. As in the preceding case, the postoperative course was smooth. Swelling of the leg disappeared even more quickly than was to be expected, and the patient left the hospital eleven days after her femoral vein ligation, having been ambulatory for several days.

Comment: It was my impression that the venogram aggravated the thrombophlebitic process in this case. Note that the upper femoral vein was patent when the venograms were taken and partially occluded at operation. Femoral vein ligation had a beneficial effect on the thrombophlebitic process both by the release of vaso-constriction incident to resection of portion of the vein and by interruption of the sluggish current of blood still flowing through the partially occluded vein. As the vein was not divided above the thrombotic process, it cannot be said that the procedure was an effective safeguard against further embolism. Further embolism did not, however, occur, and the Boston group has observed beneficial results under similar circumstances. It is noteworthy that the female artery was in a state of marked segmental contraction at the operative site, in spite of spinal anesthesia.

Case V.—B. M., Norfolk General Hospital, No. 8636, a thirty year old female was admitted on September 13, 1943. She was acutely ill with a temperature of 104.6° F., pulse rate of 136, respitory rate of 40, and white blood count of 27,700. Examination revealed a violent thrombophlebitic process involving the varicosed right saphenous vein and its branches and a pneumonic process at the base of both lungs. The patient stated that she had had enormous varicose veins in the right leg for years, and that she had been advised to have same ligated four years previously. The varicosed veins had suddenly become painful, red and hard, without apparent cause, three weeks prior to admission.

Shortness of breath and episodes of uncontrollable cough had developed during the past few days. There had been no hemoptysis or pain in the chest.

Under supportive treatment which included the oxygen tent, sulfadiazine, and enormous hot wet compresses to the right leg and abdomen—for the thrombophlebitic process crossed the lower abdomen in the varicosed superficial epigastric vein—the patient steadily improved. She was discharged from the hospital on September 28, fifteen days after her admission. The temperature, pulse rate, and leucocyte count had been normal for four days. The lungs were clear. The only sign remaining of the thrombophlebitic process was a patch of localized redness over the saphenous in the mid-thigh. No signs of deep vein thrombophlebitis had been observed at any time.

The patient was readmitted to the hospital four days later because of the sudden onset of pain in the right loin, worse with respirations, shortness of breath and paroxysms of coughing. She appeared even sicker than on her first admission with a temperature of 104.4° F., pulse rate of 142, respiratory rate of 30, red blood count of 3,430,000, white blood count of 10,300. Dulness and diminished breath sounds were observed at the base of the right lung and a chest x-ray showed a definite wedge-shaped area of consolidation at the right base. The only positive finding in the right leg was a dull brownish discoloration along the entire course of the previously inflamed saphenous. No evidence of deep vein phlebitis was found in either leg. However, having in mind the frequent coexistence of deep vein involvement in such instances, a venogram was made of the right leg, and this was interpreted as follows: "Extensive phlebitis involving the anterior and posterior tibial and femoral veins."

It now seemed clear that the patient's pulmonary complications had been embolic in nature on both her first and second admission to the hospital, and that presumably the emboli originated in the deep veins of the right lower extremity. Accordingly, femoral vein ligation was performed under pantocaine-glucose spinal anesthesia on October 5, 1943. The varicosed saphenous was enormous and solidly thrombosed. At the femoro-saphenous junction, the femoral vein felt soft and appeared normal. The profunda femoral also seemed patent. A portion of the femoral was resected at this level between double ligatures, without preliminary incision of the vein. A canalized thrombus formed a thin rim about the circumference of the resected vein. The saphenous vein was incised and emptied of its gelatinous organized material, preliminary to its ligation and division at its femoral junction. A culture and smear were taken from the saphenous stump and these were subsequently reported as showing 100 per cent hemolytic streptococci. The wound was sprinkled with sulfanilamide powder and closed without drainage.

For several days postoperatively, the right thigh was taut and swollen. Otherwise, the patient seemed remarkably well. On the fourth postoperative day, there was a sudden rise in temperature to 102.8° F. and several episodes of coughing and dyspnea. No changes were noted in the pulmonary signs and we were unable to decide whether a postoperative infarction had occurred. A transfusion had been given the previous day and the fever could have been a delayed transfusion reaction. No further similar spells occurred. The patient was discharged on the tenth postoperative day. The thigh had softened, only moderate swelling of the lower leg existed, the lungs were clear and temperature was normal.

Comment: The case illustrates spontaneous septic thrombophlebitis in varicose veins with co-existing and latent deep vein thrombophlebitis, resulting in recurring pulmonary embolism. The venograms furnished the only direct evidence that deep vein involvement existed. Whereas the ligation and division of the femoral was not entirely above the thrombotic process, it was above any free-lying clot and apparently had a salutary effect on the thrombophlebitic disease. It was apparent from the culture that the thrombosed saphenous was septic. No culture was made from the divided femoral—a regrettable omission.

The postoperative course of femoral vein ligation has usually been smooth. The procedure apparently has a salutary effect on the thrombophlebitic process, for fever, pain, and swelling rapidly disappear. This may be partly due to release of vasoconstriction incident to resection of a segment of the vein, but I believe the more likely explanation is the cessation of function with cessation of any current of blood through the vein. In any event, the patient is usually ambulatory in five to six days, and home shortly thereafter, without further embolic

episodes or other complications. Late effects of femoral vein ligation have likewise been negligible. No more leg swelling has persisted than was to be expected from the initial thrombophlebitic process, and in some instances, even less. Ligation above the profunda femoris will cause more swelling of the thigh than if the procedure is performed below this branch.

I wish to thank Dr. P. B. Parsons, of the Department of Radiology, Norfolk General Hospital, for making and interpreting the excellent venograms, and my associate, Dr. Arnold Zetlin. for his skillful management of the pulmonary complications of the cases reported.

SUMMARY AND CONCLUSIONS

The principles underlying the procedure of femoral vein ligation for the prevention of pulmonary embolism have been reviewed.

Three cases of pulmonary embolism in which the femoral vein was ligated with cessation of the embolic episodes are reported.

Emphasis is placed on early recognition of thrombophlebitis of the lower extremity, and especially of thrombophlebitis in the deep veins of the calf.

Femoral vein ligation is advocated as a routine emergency procedure whenever pulmonary embolism incident to lower extremity thrombophlebitis has occurred. In such instances, the procedure may well be life-saving. Whether femoral vein ligation is to be routinely performed in all cases of deep vein thrombosis remains to be proven, but, in time, the dictum may well be "the treatment of femoral vein thrombophlebitis is femoral ligation".

Ligature of the femoral at as high a level as possible often has a salutary effect on the thrombophlebitic process even though the ligation is not performed entirely above the inflammatory process, due to total interruption of the blood flow through the affected veins.

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DISCUSSION

DR. HUGH H. TROUT, Roanoke: Dr. Lowenberg has brought to our attention a very important piece of work. As he has said, and you know, this work originated with Dr. John Homans in Boston; and anything advocated by Dr. Homans deserves the sympathetic consideration of medical men throughout the world. It originated about four years ago. Of course, the work was started by Dr. Homans to prevent the occurrence of pulmonary emboli. The question comes up why we should not directly attack all cases of thrombophlebitis in the calf. The situation has been changed with the recent introduction of the sulfa drugs. The question has been heretofore whether we should resect the inflamed vein and stir up infection. Now perhaps we can prevent the infection by the use of the sulfa drugs.

We have had seven of these cases. We resected the vein in the calf and applied sulfa drugs, and we have had very satisfactory results. We had no unpleasant results and have had no emboli following.

We had had two very unpleasant results from the misuse of the Paevex machine. We had two cases in which the Paevex machine was used, one of them, I am sorry to say, in our own hospital. It is perfectly logical that that would dislodge and stir up emboli. Having had that experience, I am very slow to advocate using the Paevex machine or any other machine for fear of dislodging an embolus.

I do think what Dr. Lowenberg is doing is a safe procedure and that it is one worthy of the attention which it is receiving in the hands of surgeons throughout America.

DR. P. B. PARSONS, Norfolk: I should like to mention a few things about the technical procedure that is followed in the making of venograms. First of all, I have been using diatrast in all of them. This drug, while usually innocuous, can give rise to dangerous reactions. To guard against this we do eye tests in all cases. If there is a mild reaction or none it is considered safe to use the dye. If there is a severe or rapid reaction the use of this dye is contraindicated. Another factor that must be considered is the application of the cuff. Since this is applied over the calf, if it does not have the proper tension, the superficial veins will fill and the deep ones will not receive the proper amount of dye. Therefore a false positive could be obtained; that is, the deeper veins might

be reported as occluded by virtue of the fact that the dye is carried away in the superficial venous system. Some authors advocate a pressure of twenty to thirty millimeters of mercury. I think that a pressure of about forty millimeters is better. Twenty cc. of diatrast is injected, in one minute, into a branch of the saphenous. X-rays are made immediately after this injection. The technique for taking these should be thoroughly worked out before any attempt is made to inject. We usually make films at a distance of six feet, with very high penetration. The groin, thigh and leg are pictured simultaneously. Last, it must be recognized that this is a relatively new field and we have not much to go by. The only way we can achieve a high degree of accuracy in the films is by many examinations.

DR. J. GORDON RENNIE, Pulaski: I wish to mention one or two cases we had in the Pulaski Hospital. We had five. One of them was of particular interest—a young woman of eighteen, married, who had an eight-months' pregnancy and developed phlebitis before delivery. We thought this an unusually good case to try it on, because of the danger of embolus at the time of delivery. So we did the operation on this case. She made a nice recovery and had her baby a month later with no trouble. The only complication was that she had a mild infection in the wound, which I think is difficult to avoid, because the vein is infected.

Another difficulty we had in a couple of cases was that we were unable to withdraw the clot. We attributed that to operating on the case a little late. I should like to know what Dr. Lowenberg thinks about that.

DR. LOWENBERG, closing the discussion: I wish to thank Dr. Trout and Dr. Parsons for their kind discussion of the paper.

Dr. Trout mentioned the direct attack in the calf of the thrombophlebitic process. It seems to me that is going to prove more formidable than femoral-vein ligation. We are trying, in the femoral-vein ligation, to get in a clean field, away from the inflamed area. We endeavor to diagnose these cases early and ligate and divide the femoral probably three or four or five inches above the affected area.

This venogram (showing slide) does not show up well, but in the original you can see clearly the filling defect. I do not think a venogram should be taken unless there is an embolus. If the patient already has an embolus, certainly one is justified in taking a venogram.

With reference to coming down on a thrombosed vein, that has happened to me in two instances. If one resects a portion of the vein one interrupts the circulation in that vein. This usually stops the embolic process. There is no place where ligating the vein will cause more edema than the thrombophlebitic process would have done, regardless of the vein ligation. One should have the courage to go in and ligate the common iliac vein if necessary to get above the thrombophlebitis and stop the occurrence of embolism.

We have been in the habit of putting sulfanilamide solution in the wound in all cases. One is bound to get infection in some instances, as Dr. Rennie mentioned, when operating on infected veins.

Floral Eponym (16)

MAGNOLIA

THE magnificent Magnolia grandiflora that adds such delightful fragrance to our June atmosphere was named by Linnaeus for Professor Pierre Magnol (1638-1715) who introduced this splendid genus into Europe. Little is known today of this French physician and botanist. He was born in Montpellier in 1638 and died there in 1715. He graduated doctor in medicine at Montpellier in 1659 and became physician to the king in 1663. In 1694 Louis XIV made him professor of medicine at Montpellier and three years later the director of the botanical garden there. He originated the classification of plants by families and wrote several books upon botany. In 1709 the Academy of Sciences in Paris elected him a member.

Magnolia at one time occupied a place in our pharmacopoeia. The 10th edition of Wood and Bache's United States Dispensatory has this to say of it: "The medicinal properties which rendered the bark of Magnolia officinal, are common to most, if not all, of the species composing this splendid genus. * * * Magnolia is a gently stimulant aromatic tonic and diaphoretic, useful in chronic rheumatism, and capable, if freely given, of arresting the paroxysms of intermittent fever. * * * The dose of the recently dried bark in powder is from half a drachm to a drachm, frequently repeated. The infusion may also be used, but is less efficient. Diluted alcohol extracts all the virtues of the medicine; and a tincture, made by macerating the fresh bark or fruit in brandy, is a popular remedy in chronic rheumatism."

THE MEDICAL TREATMENT OF PULMONARY EMBOLISM*

JULIAN R. BECKWITH, M.D.,
Clifton Forge, Virginia.

The object of this paper is to present briefly some of the changes that occur following the development of pulmonary embolism and to stress the importance of the institution of a vigorous medical regime as soon as possible after an embolism has occurred. No attempt will be made to discuss the factors that predispose to its development nor to the management of these factors once they are recognized. The occurrence of thrombophlebitis and phlebothrombosis, their management, and their relationship to pulmonary embolism have been emphasized.[1]

In the past many of us have considered pulmonary embolism an inevitable occurrence in a fortunately small percentage of individuals who are forced to remain in bed for several days to several weeks. These emboli usually arise from thrombi that form in the veins of the lower extremities or in the pelvis. Various methods have been suggested to prevent the occurrence of these thrombi, and partial success has been attained.[1-2] If all such thrombi were recognized and if then the vein was always accessible, many pulmonary emboli could be prevented. This is not the case, however, and the importance of having available a means of medical management lies in the fact that a large pulmonary embolism may be the first indication that such a condition exists. Here prevention appears to be difficult and treatment lifesaving.

When a large embolus lodges in the pulmonary arterial trunk, the circulation is immediately completely obstructed. Blood cannot leave the right ventricle and death ensues at once. If an embolus lodges in a large trunk or in a smaller branch of the peripheral pulmonary arterial system, death may also occur rapidly. The physiological mechanism producing death cannot be due to mechanical blockage alone. Pulmonary artery ligation is done during pneumonectomy without the occurrence of shock, right ventricular strain, etc. It appears therefore that certain physiological changes occur immediately following the development of pulmonary embolus. Reflex pulmonary artery and coronary artery constriction, bronchial spasm, and gastrointestinal spasm with nausea and vomiting occur. Hypertension in the pulmonary circuit with acute cor pulmonale follows. The cardiac output decreases and systemic blood pressure falls. Due to the decrease in systemic blood pressure and to coronary artery spasm, myocardial ischemia may be pronounced and myocardial infarction may occur. Since these damaging impulses are initiated to a large extent, through the vagus, it is important to block all vagal reflexes as completely as possible. Atropine should, therefore, be used in adequate doses. Since papaverine is a vaso-dilator, it should be given simultaneously with the atropine.

Now a word about the diagnosis of pulmonary embolism. The classical picture of pulmonary embolism is not difficult to recognize. When a patient who has been lying in bed sits up or strains at stool, etc., and suddenly becomes dyspneic, develops severe substernal pain, pallor, sweating, weak rapid pulse, and low blood pressure, the diagnosis is obvious. The condition may be confused with myocardial infarction at times however even when typical. At times the symptomatology may be bizarre. Pneumonia, pleurisy or progressive heart failure may be suspected. In order to make the diagnosis in these instances, one must suspect the condition at all times and one must often employ all means to confirm one's suspicion. The finding of a hitherto unsuspected thrombosis of a deep leg vein may be a lead. X-ray examination may also be helpful. Characteristic E.C.G. changes often occur and, when they do, are almost diagnostic. These have been described by McGinn and White[4] and by Barnes.[5] The following changes were observed:

1. Prominent S-I with ST segment starting slightly below the base line.
2. Depressed RST segment in lead II with gradual ascent from S to T wave in lead II.
3. Usually a diphasic or monophasic T-II.
4. Q wave and definite inversion of T wave in lead III.
5. Positive T wave, occasionally diphasic, in Wol-

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*Read before the annual meeting of the Medical Society of Virginia, at Roanoke, October 25-27, 1943. This was read by Dr. J. M. Hutcheson due to fact that Dr. Beckwith had entered the service of the Armed Forces and could not be present.

forth lead. In lead IV-F, T-IV is inverted or diphasic.

All of the above changes are often not present, particularly with small emboli.

Careful clinical examination of the patient is very necessary and detection of signs indicating pulmonary hypertension and right ventricular failure is important. These are distended neck veins, gallop rhythm, accentuation of pulmonic second sound, distant heart sounds, low blood pressure, weak, rapid pulse, elevated venous pressure and peripheral edema.

When an acute episode occurs and the diagnosis of pulmonary embolism is made, or I believe suspected, therapy should be immediately instituted. This should be directed at relieving the anoxemia by the administration of oxygen in high concentration and simultaneously making an effort to re-establish the impaired circulation. The latter can be done in a number of instances by the administration of atropine grains 1/50 and papaverine grains ½ intravenously. Atropine inhibits vagal activity and papaverine relaxes smooth muscle.[6] Then atropine grains 1/100 and papaverine grains ½ should be given every four hours until the danger is past. The response is often very dramatic, and a patient who looks moribund may be "responsive" in a short while. The heart rate becomes slower, blood pressure rises, the heart sounds become louder, and the color improves.

During the past two years, three cases of pulmonary embolism have been seen shortly after the condition occurred. All were treated as described and all obtained dramatic relief following the initial attack. Two died later with subsequent attacks and one recovered completely. It is probable that had the focus of the embolus been found, the latter episodes could have been prevented. The cases are presented:

CASE REPORTS

Case I.—Colored male, age 56, admitted to C. & O. Hospital 10-11-41 convalescing from pneumonia. He had been given sulfapyridine and developed an acute hemolytic anemia. All typical signs and symptoms as well as laboratory evidence of acute anemia were present. He was transfused three times and his hemoglobin and red blood count had come up to a satisfactory level. He continued to run a low grade fever and on his eighth hospital day, moderate tenderness of both calves was noted. No edema was present. The possibility of thrombophlebitis was considered and he was kept at complete bed rest. Eleven days later he suddenly developed severe dyspnea, sweating, and pallor. Pulse could not be obtained and heart sounds were very distant. The pulmonary second sound was moderately accentuated as compared to the aortic second sound. The neck veins were distended and he looked moribund. Oxygen was given by means of a tent. An E.C.G. was taken which showed evidence of acute cor pulmonale. Atropine grains 1/50 and papaverine grains ½ were administered intravenously. Within five minutes the patient looked considerably better. His pulse became palpable, the heart sounds improved, and dyspnea became much less severe. Atropine grains 1/100 and papaverine grains ½ were given every four hours for the next two days. The oxygen was continued during this time. A portable x-ray of the chest was taken the day after the attack occurred. This showed a triangular area of density near the right hilus. This was thought to represent pulmonary infarction.

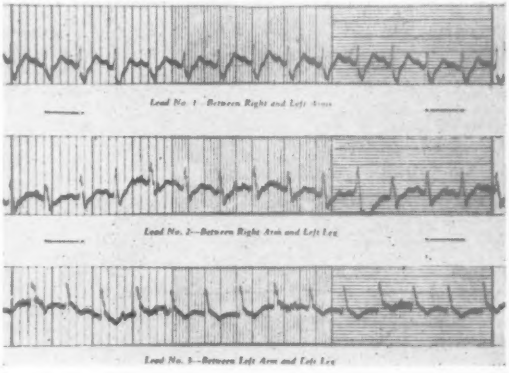

Chart 1.

Chart I shows the E.C.G. taken within 25 minutes after the attack occurred. There is a deep S-I and widened QRS complexes in all leads. RST-III is slightly elevated. Q-III is present and T-III inverted. One could mistake this for posterior basal infarction, but the deep S-I and widened QRS complexes are rather typical of acute right ventricular strain. Chart II shows an E.C.G. taken 18 hours after the attack. In this E.C.G., S-I is still present, but the QRS time is now normal and further E.C.Gs. show essentially this same tracing. This

patient progressively improved and was discharged from the hospital on 11-22-41 as well. We did not establish from where the embolus arose, but it was probably either a deep calf vein or the pelvic veins.

Case II.—A 57 year old white male was admitted to C. & O. Hospital 11-30-41 and discharged 12-20-41. A right inguinal hernia was repaired and a rectal polyp removed. The convalescence from these procedures was entirely uneventful.

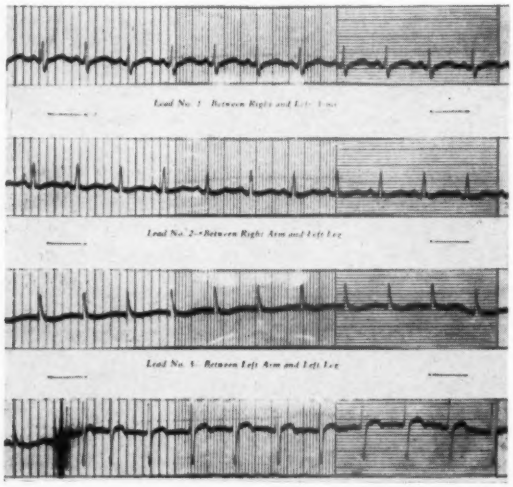

Chart 2.

He was next admitted 1-13-42, and a diagnosis of right lower lobe pneumonia made. No specific organisms were found in the sputum, but his clinical history and physical findings were typical. Sulfathiazole therapy was instituted and convalescence was uneventful. On the second day after discharge he noted slight swelling of the left ankle. This became progressively more severe. On the night of admission he suddenly developed severe substernal pain, dyspnea, and sweating. This lasted about one hour and recurred two hours later. His local physician sent him to the hospital.

On admission he was pale, sweaty, and cyanotic. The neck veins were distended, and the heart sounds were distant and rapid. A gallop rhythm was present at the apex. The blood pressure was 80/60 in both arms. The liver edge was percussed 2 cm. below the costal margin. There was definite swelling and cyanosis of the left lower leg and ankle. Tenderness was present in the calf and popliteal space.

Chart III shows the E.C.G. taken at 12:30 that night. There is evidence of right ventricular strain as shown by the presence of S-I and widened QRS complexes. The negative T-II-III and convex elevated ST-II-III are consistent with myocardial

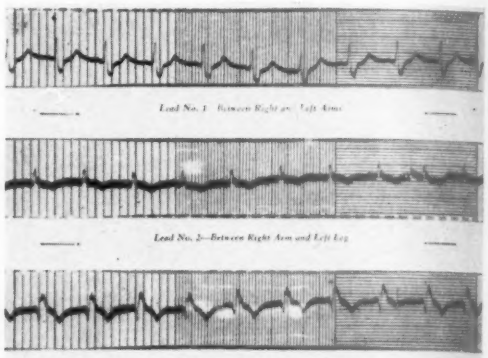

Chart 3.

ischemia. He was given an oxygen tent and atropine grains 1/50 with papaverine grains ½ were given intravenously. He improved in a short time and had a very good night. Grains 1/100 of atropine and

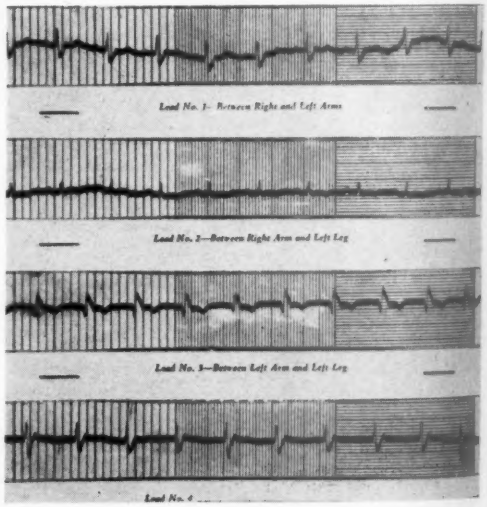

Chart 4.

grains ½ of papaverine were continued every four hours. Chart IV shows an E.C.G. taken the following day. The duration of QRS had decreased and ST elevation in II and III had decreased. This

indicates lessening of right ventricular strain and probable decrease of myocardial ischemia.

Conservative measures were instituted, though surgical ligation of the femoral vein was considered. The patient developed four other attacks of pulmonary embolism and right heart failure occurred. Measures to combat this were employed. Thrombophlebitis of the right leg developed and a pulmonary embolism occurred 2-5-42 which produced death in five minutes. At autopsy, many pulmonary emboli were found and a large embolus was obstructing the main pulmonary trunk. Thromboses of iliac veins and vena cava 5 cm. above the bifurcation were found.

Case III.—The third case is that of a colored male, age 49, who was admitted to the C. & O. Hospital 11-1-42. On 11-4-42 a bilateral inguinal herniorrhaphy was performed. On 11-16, the 12th post-operative day, pleuritic pain and elevation of temperature occurred. Chest x-ray showed evidence of infiltration in both bases, and was thought to be due to post-operative bronchopneumonia. Sulfadiazine therapy was commenced and his temperature began to fall, associated with clinical improvement.

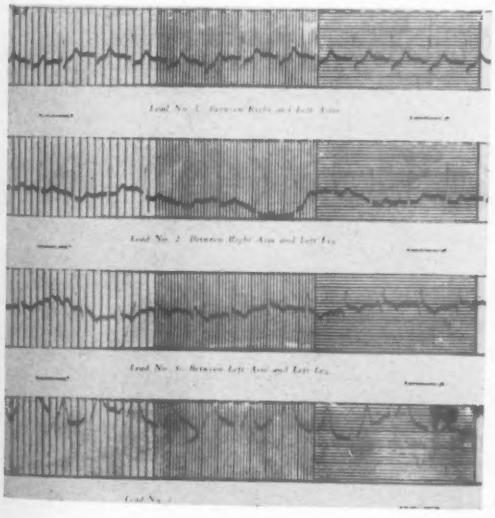

Chart 5.

On November 21, he suddenly developed severe pleuritic pain in the left chest anteriorly. Dyspnea was marked. All of the peripheral veins were collapsed, profuse perspiration occurred, the pulse increased to 130 and blood pressure was 60/50. Chart V shows an E.C.G. taken immediately. There is deep S-I with depressed RST-I indicating right ventricular strain. Q-III is present, ST-III elevated and T-III negative. Papaverine grains 1, atropine grains 1/50, and aminophyllin grains 7½ were given intravenously and he was put in an oxygen tent. He improved dramatically and he had a fairly good night. The next A. M. he looked considerably better. Atropine grains 1/100 and papaverine grains 1 were continued every four hours. Chart VI shows an E.C.G. taken 14 hours after the previous one. S-I had disappeared, Q-III is smaller, and ST-III less elevated. The next two days were uneventful. He seemed to be improving when he died suddenly three days after the initial severe attack of pulmonary embolism. Just where the original focus was, was not determined. There was no evidence of peripheral thrombophlebitis, and it is probable that unrecognized pelvic vein thrombosis was present.

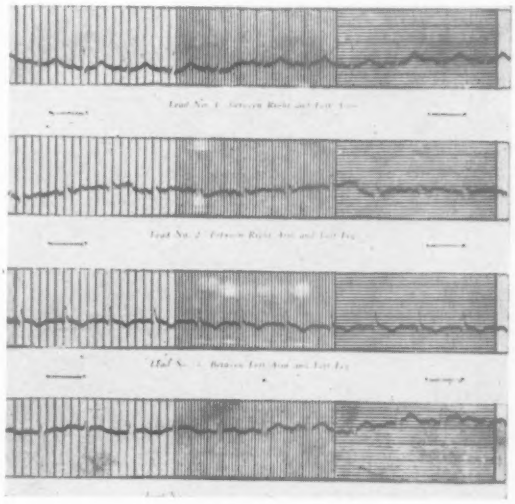

Chart 6.

SUMMARY

The physiology of pulmonary embolism has been briefly discussed. Emphasis on vigorous medical treatment is stressed. Three cases were presented.

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DISCUSSION

DR. H. B. MULHOLLAND, Charlottesville: Dr. Hutcheson asked me to say a word or two about this paper. I think I shall only emphasize a few of the points that have been brought out.

The important fact is that all of us, when confronted with a case of pulmonary embolism, are about as panic-stricken as the patient is. But, as brought out here, there is something one can do which may in some cases be life-saving. I think, also, Dr. Hutcheson will agree that in most instances it is not necessary to have an electrocardiogram made to establish the diagnosis. The electrocardiogram simply confirms the diagnosis. The clinical picture is usually self-evident.

Dr. Beckwith mentioned the fact that pulmonary embolism might be confused with acute myocardial infarction, which is true. But if one is confronted with the same set of symptoms and the diagnosis is acute myocardial infarction, one may use exactly the same treatment, namely, atropine and papaverine—atropine being given intravenously. One-fiftieth of a grain of atropine given intravenously sounds like a heroic dose, but it is necessary to treat these patients heroically in order to save them from impending disaster.

A few years ago, in a paper published in the *Journal of the American Medical Association,* it was brought out at autopsy that many of these patients had died of a very small pulmonary embolism and, that the apparent cause of death was the reflex effect from the vagal impulses that Dr. Beckwith mentioned in his paper. The treatment with atropine and papaverine, the latter drug is very difficult to get now, is sound and will undoubtedly save some lives.

DR. EUGENE L. LOWENBERG, Norfolk: I have treated a good many cases of milk-leg and have been interested in the problem of pulmonary embolism. I have made it a rule that if a patient shows any signs of pulmonary embolism to give Papaverine Hcl, ½ grain intravenously, at once, and 1/100 grain of atropine subcutaneously. It must be given right away. I think the order should read: "Give 'stat.' if signs suspicious of pulmonary embolism develop, without waiting for the physician or interne to arrive." Atropine and papaverine should be given immediately.

I notice Dr. Beckwith did not mention Heparin. And, frankly, I think he was wise, because I cannot see the rationale of its use in these cases and I have seen pulmonary embolism develop in these cases under the use of Heparin.

One case in six who has had an embolus will develop another from which he will die. Since ninety-nine per cent of all cases of embolus develop from thrombosis in the veins of the leg, if ligation of the femoral vein is done at once, perhaps one patient in six will be saved by this method.

DR. J. M. HUTCHESON, closing the discussion: I do not think that Dr. Beckwith intended to convey the impression that the diagnosis of pulmonary embolism is an electrocardiographic matter. Occasionally an electrocardiogram is very helpful in differentiating pulmonary embolism from other conditions, especially myocardial infarction.

Pulmonary embolism is a rather common condition. It is usually thought of as occurring after surgery, but frequently it also occurs in cases which have not had surgery. In the three cases Dr. Beckwith reported the pulmonary embolism followed pneumonia. Whether the sulfonamides had anything to do with that it is hard to say, but it is rather striking that all three cases had had that treatment. Nowadays, however, few cases are allowed to have fever very long without getting sulfonamides of some kind, so that may be a coincidence.

We think of pulmonary embolism as belonging to three classes: the mild case that recovers without any treatment, the severe case that dies in spite of treatment, and the intermediate case that requires some help but may recover. I think it is our duty, therefore, to differentiate these cases as soon as possible and apply what treatment we have.

QUESTIONS ON THE VITAMIN B COMPLEX AND ON IODIN, SULPHOCYANATE, AND MENDELEJEFF'S LAW

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Richmond.

Clinicians are constantly running into things they would like to refer to their colleagues engaged in research, much as a farmer takes his grist to the miller to be ground. While this is probably not what Dean Jacques P. Gray had in mind for the College number* of the MONTHLY, I should like to use his invitation as an opportunity to ask certain questions. It may be that some of the answers are available already, in the Library.

Mills[1] said that tropical people seem doubly handicapped with respect to B vitamins, in that their requirements are higher and their supply more deficient than those of people living in cooler climates. If this is so it is contrary to a good deal of biological philosophy, and an opposite finding as to requirement of B_1 was reported by other investigators.[2] Mills stated that tropically grown meats seem to be deficient in thiamin, for test feedings with Panamanian pork loin gave much lower excretion rates than did those with pork imported from the United States.

I. Are there geographical variations, dependent upon climate, in the vitamin B content of foods? There seems to be such a variation in the vitamin A content of milk.[3] Milk in Wisconsin showed a much lower content of carotene and vitamin A in the January-April period than in the June-October period. In Tennessee the peak came in April; in Wisconsin, in July; and in New York, in October. The peak in Tennessee was considerably lower than in Wisconsin and New York. The minimum, in January, was similar for the three.

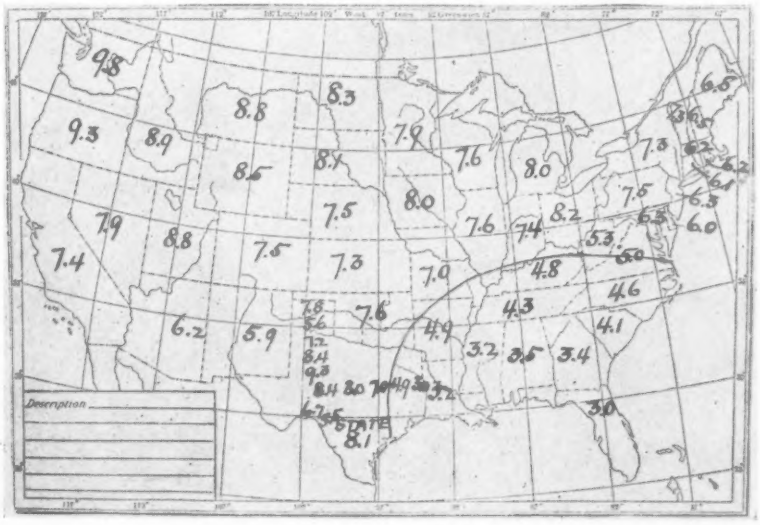

Fig. 1. Yield of wool per sheep, by states, in 1926. The years 1926-1929 show only negligible differences. United States Department Agriculture: Yearbook of Agriculture, 1930, p. 880.

Elvehjem and his coworkers found that the nicotinic acid content of different samples of yeast varied from 30 to 100 mg. per 100 Gm., dry weight, and this made difficult a comparison between dog assay and chemical methods.[4]

II. (a) Does black tongue in dogs in the United States have a geographic distribution and seasonal variation similar to endemic pellagra? (b) Is this deficiency disease tied up with the socio-economic

*This paper was prepared for the Medical College of Virginia issue of the MONTHLY, but, on account of limitation of space, is one of a number whose publication had to be postponed.

status of the dog's master, or is his meat, like the Panamanian meat, relatively deficient in an anti-black tongue factor.

In 1938, in a personal communication, the Chief of the Pathological Division, Bureau of Animal Industry, United States Department of Agriculture, wrote that so far as his office knew, there were no statistics available on the geographic distribution and seasonal incidence of black tongue in dogs. But another name for the disease is southern canine plague, and veterinarians have said to me that its distribution is distinctly southern.

III. By what nutritional control do sheep in "the pellagra belt" grow less wool than those outside the belt? Inside the area of endemic pellagra the yield of wool is less than 5 pounds per sheep; outside, it is nowhere so low (see Fig. 1).

According to Winegar and his coworkers,[5] sheep seem to be able to synthesize nicotinic acid. While dogs restricted to a typical black tongue-producing diet, after about twenty-eight days, virtually cease to excrete nicotinic acid in the urine, sheep continue to excrete it on a diet deficient in this constituent, and it is not essential for their growth.

IV. Though Mendelejeff's law is stated as applying to elements only, does the atomic weight of iodin and the sum of the atomic weights of the radical SCN relate them according to the principle of the periodic law, and thus account for certain physiological and pharmacological relationships that they have?

CN, an inhibitor of oxidation in tissues, is detoxified by S, to form SCN.

At ordinary temperatures HCNS polymerizes, forming an amorphous yellow substance. The 3-ploymer conception of SCN, like the radical itself, fits neatly into the halogen group with respect to the periodic law.

C	N	F	S	Cl	SCN	Br	I	(SCN)3
12	14	19	32	35.4	58	80	126	174
			I	126.0		C1 35.4		Br 80
				2)161.4		2)115.4		2)254
				80.7		57.7		127
				Br 80.		SCN 58.		I 126

In Pauli's system the sulphocyanate radical exerts the maximum inhibitory effect on the precipitation of protein, next to it being iodin and bromin ions.[6] Sulphocyanate of the saliva is diminished or disappears entirely during the administration of iodin.[7]

Marine and his coworkers investigated the goitrogenic factor in cabbage fed to rabbits,[8] and following the investigation found that by injection of methyl cyanide (acetonitril) they could readily produce exophthalmos, proportional to the goiter, in rabbits.[9] The administration of iodin to rabbits with intact thyroids prevents the exophthalmic reaction to methyl cyanide. The feeding of potassium iodide[12] and of thyroid[13] to mice protects them against acetonitril.

Winter cabbage, not summer cabbage, produces goiter when fed to rabbits. The cabbage contains a goitrogenic agent, and an antigoitrogenic agent other than iodin, possibly hexuronic acid. This antigoitrogenic substance is present in a great variety of plants but in highly variable amounts as regards age, species, and climate.[12] The antigoitrogenic substance in cabbage showed a seasonal variation, in 1929, as expressed in the following ratios: April 5.4, July 4.7, September 3.5, October 3.5, November 2.8, December 2.6.[13]

The foregoing notes doubtless suggest other questions that some investigators might regard as more immediate and more pertinent than those that have been formulated.

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FALSE NEGATIVE RESULTS IN THE FRIEDMAN TEST FOR PREGNANCY

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This paper is limited to the discussion of errors in the Friedman's rabbit test for pregnancy in which negative results have been reported when the patient tested was actually pregnant. These cases are being reported because we feel that one reason has been found for false negative results in the Friedman's test and we believe that unnecessary errors may be eliminated in this biological test which has been found to be otherwise very dependable.[1]

The technique of the Friedman's test is as follows: A morning specimen of urine is collected and preserved by refrigeration or chemically if necessary. This urine is filtered and ten cc. injected into the ear vein of a mature non-pregnant rabbit. At the end of twenty-four hours the injection is repeated. Forty-eight hours after the initial injection a laparotomy is performed upon the rabbit and a positive test is shown by the presence of from two to fourteen corpora hemorrhagica or corpora lutea in either ovary. A negative test is reported when the ovaries remain small in size and show no change.[2]

As shown by Friedman in his original paper, if positive, the test is one hundred per cent accurate.[3]

The test as used throughout the country has been found to be very accurate if a positive test is reported, and about 95 per cent accurate if the result is negative. In order to insure the accuracy of the test the rabbit must be mature, and not pregnant, nor in heat, and the urine must be a morning specimen and preserved if the test is delayed.

Prior to 1940 in the laboratory of the Elizabeth Buxton Hospital, though no statistical analysis was made, it was felt that if a negative result was reported the report could be depended upon in 98 per cent of the cases tested. However, in the same laboratory and under the same conditions since 1940 the negative results have been found to be accurate in only about 70 per cent of the cases. Naturally, an attempt was made to find the cause of this large error, which had not been previously evident, and which has been noted only in the past few years. It was found in thirty-four cases tested that the total number of errors was eight. Of these eight errors there is reason to suspect that in one case the patient brought in the wrong urine specimen. In another case it is known that the urine specimen was secured in the afternoon, rather than in the morning. In two other cases no reason for failure could be found. Of the four remaining cases of false negative reports all four patients had received an estrogenic hormone prior to the examination of the urine.

These four cases are reported in detail as follows:

Case 1.—A multiparous white woman, forty-two years old, was referred to the hospital on April 6, 1940, for removal of an ovarian cyst. Menstrual periods had been irregular for about one year and there had been some recent spotting. Examination revealed a large fluctuant mass in the right lower quadrant. Pregnancy was suspected but no fetal heart sounds could be heard, nor were movements felt. The patient was highly neurotic. A Friedman's test was negative and operation was advised. A normal pregnancy was found and the pregnancy was interrupted with the concurrence of the attending physician because of psychosis, a hysterotomy being done. The patient was then found to have been receiving theelin for over a period of some months because of menopausal symptoms.

Case 2.—A twenty-eight year old white woman was operated upon on May 12, 1942, and a left ovarian cyst was removed. Following this, menstrual periods were irregular for several months. In February, 1943, she was examined for irregular bleeding for which no cause could be found and the patient was given several injections of theelin. A Friedman's test on February 19 was negative for pregnancy, but this patient aborted on March 19, 1943.

Case 3.—A multiparous white woman, thirty-nine years old, was seen at the clinic on July 22, 1941, having missed one period. She had been under treatment in another city for menopausal symptoms for six weeks and had received several injections of theelin. A Friedman's test was negative but a clini-

cal diagnosis for pregnancy was made and the patient delivered spontaneously in March, 1942.

Case 4.—A twenty-eight year old white girl had missed two menstrual periods and a urine specimen was sent in by her family physician. A first morning specimen was used for the test, which was negative. Another specimen was sent in ten days later which, likewise, was negative. Her physician was questioned about the possibility of the patient's taking medicine of any kind. He denied that she was, but upon further investigation it was found that the patient was taking stilbestrol on her own accord. She was taking at least one mg. daily. She was advised to discontinue this for one week, at which time a third specimen was submitted and this proved to be strongly positive. The subsequent course of this patient has proved the diagnosis of pregnancy to be correct.

In addition to the above four cases in our series the following case is reported, having been seen by a member of the staff during the past two years:

The patient, a multiparous white woman, twenty-six years old, was seen one week after she had missed a menstrual period. It was not thought that she was pregnant and she was given ten milligrams of stilbestrosal by mouth daily for one week. Three months later she was seen and found to be four months pregnant. She delivered spontaneously at term. (Dr. Emanuel Greenspon).

An additional case was treated as follows: The patient, a colored girl, twenty years old, six months pregnant, was examined and a Friedman's test performed and reported as positive. During a period of seven days she was given a total of 40,000 units of theelin in oil intramuscularly. A Friedman's test performed two days after the last dose of theelin was negative.

It is interesting to note at this point that, in a paper published in 1934 by Davy and Sevringhaus, titled: "An Analysis of Pregnancy Tests",[4] one case was reported in which a negative result was obtained ten weeks after the patient had missed a menstrual period and a positive result was obtained after the fourteenth week of gestation. Prior to the first test it is stated that the patient had received four doses of theelin in oil. In that paper the false negative result was attributed to hormonal imbalance, but in view of our experience it was undoubtedly due to the injection of theelin.

It is evident from the cases examined during the past three years in our laboratory that the percentage of false negative results of the Friedman's test have been exceptionally high. It has been realized that the majority of these false results were obtained on patients who had been getting an estrogenic hormone. Furthermore, in one case of known pregnancy with a positive rabbit test, the patient was given large doses of theelin in oil intramuscularly and a negative Friedman's test was obtained thereafter.

In conclusion, it is possible to state that the results of the rabbit test for pregnancy as described by Friedman may be influenced by the administration of stilbestrol or theelin.

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PRIMARY ATYPICAL PNEUMONIA

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Recently the literature has been fashioning a clinical picture of a syndrome characterized by an acute respiratory infection associated with atypical pulmonary lesions in which bacteria are apparently not the prime etiological factor. Numerous publications[1-6] have described essentially the same syndrome by a variety of names, but the terminology we have adopted is "Primary Atypical Pneumonia" as suggested by The Surgeon General of the United States Army.[7]

The etiology of this type of pneumonitis is, at present, unknown, and bacteriological studies on the blood and sputum have failed to reveal any definite etiological organism in the uncomplicated cases. However, animal passage and serological studies by Stokes and Kenny,[8] Francis and Magill,[9] and others, strongly suggest a filterable agent recovered from the nasopharyngeal secretions as a possible causal factor. Future studies may prove that primary atypical pneumonia is not a single disease entity, but rather a clinical syndrome with multiple etiologies.[10]

The fifty-nine cases of primary atypical pneumonia comprising this report were observed in England and in northwest Africa among American troops. (The first fifteen cases in this series were studied in October, 1942, in England, and the remaining forty-four cases observed in northwest Africa during the months of January and February, 1943). This series of cases, all of which exhibited positive x-ray findings, were analyzed from the standpoint of signs, symptomatology, x-ray data, clinical course, and therapy; and the results form the basis of this report.

I—CLINICAL FEATURES ON ADMISSION

A. Onset (see Chart I). A gradual onset of symptoms was noted in 83 per cent of the cases. That is, a period of two or more days elapsed between the onset of initial symptoms and the patient's hospitalization, this being considered as the criteria of a gradual onset. Of this 83 per cent, a two to five day period of onset was noted in 60 per cent, a six to nine day onset in 30 per cent, and ten or more days in 10 per cent. Only ten of the cases (17 per cent) had an explosive onset, ranging from three to thirty-six hours.

CHART I

ONSET SYMPTOMS OBSERVED IN PRIMARY ATYPICAL PNEUMONIA—BASED ON 59 CASES

CHILLINESS	85%	(50 out of 59 cases)
GRADUAL ONSET	83%	(49 out of 59 cases)
GENERALIZED ACHES	81%	(48 out of 59 cases)
NON-PRODUCTIVE COUGH	80%	(47 out of 59 cases)
BACKACHES	76%	(45 out of 59 cases)
MALAISE	75%	(44 out of 59 cases)
LUNGS (ABNORMAL SIGNS)	73%	(32 out of 44 cases)
THROAT REDDENED AND INFLAMED	68%	(30 out of 44 cases)
LEG ACHES	66%	(39 out of 59 cases)
CHEST ACHES	64%	(38 out of 59 cases)
ARM ACHES	61%	(36 out of 59 cases)
FEVER, HOT FEELING	56%	(31 out of 59 cases)
HEADACHES	54%	(24 out of 44 cases)
ANOREXIA	41%	(18 out of 44 cases)
PRECEDING URI	37%	(22 out of 59 cases)
SORE THROAT	30%	(13 out of 44 cases)
CHEST PAIN	25%	(11 out of 44 cases)
PRODUCTIVE COUGH	20%	(12 out of 59 cases)
SUDDEN ONSET	17%	(10 out of 59 cases)
TRUE CHILL	7%	(4 out of 59 cases)
CONSTIPATION	7%	(3 out of 44 cases)
NAUSEA	5%	(2 out of 44 cases)
DYSPNEA	2%	(1 out of 44 cases)
CYANOSIS	0%	(0 out of 44 cases)
NOSE BLEEDS	0%	(0 out of 44 cases)

B. Chilliness. In contra-distinction to the characteristic true shaking, teeth-chattering chill which usually accompanies the onset of bacterial pneumonia, and which was found in only 7 per cent of these primary atypical pneumonia cases, chilliness was the initial complaint in 85 per cent of the

cases. We were definitely impressed with the fact that this differentiation between chilliness and true chill was of real diagnostic value, a bacterial pneumonia or malaria being strongly suspected in cases having a true chill.

C. Generalized Aching. Eighty-one per cent of the patients complained of an aching of one or more joints of the body—the predominant site being the low back. Headaches were present in 54 per cent of the cases. In a small group of cases the headaches were of such severity as to suggest the possibility of meningitis, but nuchal rigidity and Kernig signs were lacking in each case. The generalized aching seen in these cases of primary atypical pneumonia did not seem to be as severe as that complained of by patients with virus influenza.

D. Cough. Cough was present in all cases and was non-productive in 80 per cent of the cases. Two cases showed blood-streaked sputum, but there were no cases of frank hemoptysis or rusty sputum. Changes in the character of the cough noted during the course of the disease are discussed later.

E. Malaise and Abnormal Weakness. These symptoms were noted in 75 per cent of the cases, being exceeded in frequency as the predominant complaint only by chilliness and cough.

F. Anorexia. Forty-one per cent of the cases complained of anorexia, while nausea was complained of by 5 per cent. No vomiting was encountered. Constipation was present in 7 per cent of the cases.

G. Preceding Upper Respiratory Infection. Preceding upper respiratory infection, including symptoms of coryza, was present in 37 per cent of the cases. It is our opinion, as well as the opinion of others,[10] that upper respiratory infection is not a common precursor of primary atypical pneumonia.

H. Chest Pain. Chest pain, usually substernal, present only on coughing and uninfluenced by respiration, was present in 25 per cent of the cases.

I. Onset Dyspnea. Dyspnea was present in one case, which is in marked contrast to the characteristic onset of bacterial pneumonia.

II.—Physical Examination on Admission

1. An inflamed nasopharynx was noted in 60 per cent of the cases.

2. Abnormalities in physical examination of the chest were noted on admission in 73 per cent of the cases.

a. *Inspection*—no changes noted.

b. *Tactile Fremitus*—decreased over involved areas in 7 per cent of the cases.

c. *Percussion Impairment*—noted in 10 per cent of the cases. This abnormality was in the form of dullness over involved lung area.

d. *Auscultation*—suppressed breath sounds were noted in 30 per cent of the cases, voice changes in 5 per cent. Rales, principally coarse in character, were heard in 58 per cent of the cases at the time of admission. Bronchial breathing was noted in only one case.

3. The temperature on admission averaged 100.5 degrees Fahrenheit. The highest temperature in the series was 103.2 degrees Fahrenheit, and the lowest was 97.0 degrees Fahrenheit.

4. The pulse rate on admission averaged ninety-eight per minute, with extremes of a hundred and fifty and fifty-eight.

5. The average respiratory rate on admission was twenty-one per minute, with twenty-seven as the highest, and eighteen as the lowest rate.

6. Cyanosis was not observed.

III—Laboratory Data

The white blood cell count averaged 7,400 per cubic millimeter on admission, while the highest was 14,140 per cubic millimeter and the lowest was 4,100 per cubic millimeter. The differential count averaged 62 per cent polymorphs and 38 per cent lymphocytes. The red blood cell count averaged 4,120,000 per cubic millimeter.

Albumin and pus cells were found in two of the non-sulfonamide-treated cases, while red blood cells were found in four of the seventeen sulfonamide-treated cases. However, no clinical urinary complications were encountered in this series.

IV—X-ray

There were positive roentgenological findings in all cases in this series. Chart II shows the distribution of the lesions. The lower left lobe was the favorite site, being observed in 43 per cent of the cases. The right lower lobe was involved in 35 per

Chart II

Location of Roentgenological Signs

Right Upper Lobe	0%
Right Middle Lobe	5%
Right Lower Lobe	35%
Left Upper Lobe	10%
Left Lower Lobe	43%
R. L. L. and L. L. L.	2 cases
R. M. L. and L. L. L.	1 case 7%
R. M. L., R. L. L., and L. L. L.	1 case

cent of the cases. Two or more of the lobes were involved in 7 per cent of the cases.

The lesions were usually apparent on admission, or appeared within the first forty-eight hours of hospitalization. The character of the lesions, in the majority of the cases, correspond to that described by Dingle and Finland[10]—a soft, fan-shaped area of hazy irregular mottling extending outward from the hilum towards the periphery of the lung field, and seldom occupying more than a portion of a lobe.

V—Sedimentation Rate

Sedimentation rate determinations were made in eight cases and were found to be elevated in all of the cases, averaging 22, 25 millimeters per hour.

VI—Clinical Course and Complications

That the average clinical course of this disease entity is mild, was borne out in this series, the average febrile period being five and eight-tenths days after admission to the hospital, and the average period of hospitalization being twelve days. The longest febrile period was twenty-one days; this patient also required the longest period of hospitalization, namely, thirty-three days. There were no deaths, and only four of the cases were classified as seriously ill.

In every case the temperature fell by lysis, a significant secondary rise in temperature after the third day of hospitalization occurring in approximately 10 per cent of the cases, of which 7 per cent were accounted for by an associated migration of the lesions to other lobes.

Seventy-three per cent of the cases revealed some abnormality on physical examination of the chest at the time of admission, and an additional 8 per cent, making a total of 81 per cent, developed abnormal pulmonary physical signs at some time during their hospital stay. The commonest abnormal findings, on examination of the chest during the later stages of the illness, were coarse rales, either over the involved lung area, or throughout the chest. The rales were noted particularly when the cough became productive.

The majority of the patients developed a persistent and almost intractable cough which failed to respond regularly to medication, often becoming paroxysmal in character, and usually worse at night. In all of the cases the cough became productive at some period during the course of the illness, the sputum usually ranging from a watery consistency to a tenacious yellowish material containing the usual bacterial flora of the nose and the throat. None of the cases displayed rusty sputum, although blood-streaking was noted in two cases, probably resulting from severe coughing.

No cases of bacterial secondary invasion developed in this series, the criteria of such a complication being a purulent sputum from which could be cultured a predominant pathogenic organism and a leukocytosis.

In four cases, where the febrile period was among the most prolonged in the entire group, the convalescent period was associated with considerable asthenia as manifested by abnormal fatigability and marked lability of the pulse rate.

Pleural effusion complicated six cases, or approximately 10 per cent of this series. In these patients the average febrile period was nine days, and the average hospitalization was twenty-one days. In this complication there was usually a sustained elevation of temperature, an increased respiratory rate, and somewhat more pronounced asthenia. In no instance did empyema develop, and the effusion was completely resorbed before discharge in every case.

A bizaare, and probably rare, complication developed in one patient; this being a herniated nucleus pulposis following a severe paroxysm of coughing.

VII—Therapy

Our experience in the treatment of this disease tends to support the accepted belief that the therapy of primary atypical pneumonia is entirely supportive or symptomatic. As no cases of secondary bacterial invasion developed in our series, the use of sulfonamides was limited to those cases in which the drug had been started by a medical officer prior to admission to the hospital. In these cases the same sulfonamide was continued in full dosage until a total of twenty-five grams of the drug was given, unless a drug reaction developed which compelled discontinuance of this therapy. Seventeen of the cases received sulfonamide therapy, sulfathiazole or sulfadiazine being the drugs employed. The average period of hospitalization of these seventeen cases was seventeen days, and the average febrile period was ten days. Comparing these figures with the average period of hospitalization for the entire group (twelve days) and the average febrile period for the same group (five and eight-tenths), it is concluded that the sulfonamides were not only without benefit in the treatment of uncomplicated primary atypical

pneumonia, but that their use resulted in a prolongation of the average febrile period and the total period of hospitalization. It is the authors' belief that the conclusion reached is valid because sulfonamide therapy given by the above criteria was not reserved for the more severe cases of the group.

With the exception of those patients receiving sulfonamide, all cases received codeine sulphate, grains $\overline{ss}$, and aspirin, grains ten, every four hours until the temperature returned to normal, after which a cough mixture containing codeine sulphate, grains one-quarter, to each dram of elixir terpine hydrate was given as needed in an attempt to control the cough.

Oxygen therapy by a nasal catheter, or B L B mask, was successfully used for relief in the one case complaining of dyspnea, but an attempt to relieve two cases with marked paroxysms of coughing by the use of oxygen was unsuccessful. Steam inhalators, with tincture of benzoin in some instances, seemed to be helpful in relieving this annoying paroxysmal cough.

VIII—SUMMARY

From a clinical analysis of fifty-nine cases of primary atypical pneumonia, attention was called to a symptom complex which we believe to be rather characteristic of this disease. A gradual onset with chilliness, cough usually non-productive in the early stages, muscular aches, and substernal pain on coughing was found in the majority of the cases, later proven roentgenologically to have primary atypical pneumonia. The sudden explosive onset with true chill, dyspnea, cyanosis, cough productive of rusty sputum, and pleuritic pain accentuated by deep breathing, symptoms usually associated with lobar pneumonia, were lacking in this series. Of further differential diagnostic value was the paucity of abnormal physical signs in the chest, and the absence of leukocytosis in these cases, in contradistinction to the signs of pulmonary consolidation and leukocytosis characteristically found in bacterial pneumonia.

In our experience, the clinical course of this disease is usually mild with few complications. Pleural effusion, which developed in 10 per cent of our series, was spontaneously resorbed within ten days in each case and no cases of empyema were observed.

It is our opinion that sulfonamide therapy is contra-indicated in uncomplicated cases of primary atypical pneumonia. Using sulfonamides in a group of unselected cases it was found that the average febrile period was nearly doubled (from 5.8 days to 10 days) and the average period of hospitalization increased about 30 per cent (from 12 days to 17 days).

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SPINA BIFIDA AND POLYDACTYLY IN ONE-EGG TWINS—
Case Report and Medical Aspects*

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It has been found that twins occur once in every eighty-six births, and 25 per cent of the twins are monozygotic (arise from one egg); while 75 per cent are dizygotic (arise from two eggs).[1] Before making a study of any pair of twins, it is necessary to determine whether they are monozygotic or dizygotic. One egg twins are referred to loosely as identical twins because they are usually very similar. Newman has set up certain criteria for the diagnosis of one egg twins by the similarity method.[2] The other method of determining whether a pair of twins originated from one or two eggs is based on the relations between the placenta and its membranes. All authorities agree that twins which possess two amnions and no chorion in the partition wall are from a single egg. When twins come from two ova, there are always two amnions and two chorions, and we find each child contained in a separate set of membranes. When twins come from a single ovum, they are usually contained in the same chorion, but each possesses its own amnion. In occasional cases only one amnion is present for both children. This condition is unusual and is thought to result from a perforation of the wall separating the two amniotic cavities.[3]

Spina bifida occurs in about one out of every 1,000 single births.[4] There have been no cases of spina bifida reported in which the condition was found in one-egg twins.

Polydactyly is that condition in which there is found more than the usual number of digits on the hands or feet. The condition is usually present on both hands or both feet when it is found.

I wish to present a case which is interesting in regard to the above discussion.

REPORT OF CASE

M. B.—A 24 year old negro womaan was first seen in the Maternal and Child Health Clinic in Crewe, Virginia, March 24, 1943, at which time she gave a history of her last menstrual period having started on August 15, 1942. The duration of the period was four days. Her past history revealed that she had normal deliveries six years and five years previous to the time of examination. Eighteen months previously she had a stillbirth at full term.

The physical examination revealed a pregnancy of eight and one-half months. All physical and laboratory findings were within normal limits.

On April 13, 1943, she began labor at 9:00 A. M. and delivered identical twin females spontaneously at 1:00 P.M. in the presence of a midwife. The placenta was examined by an experienced and reliable midwife and found to be single (not in any way divided), and there were two cords attached to the placenta at different places. The twin babies were contained in a single compartment of membranes with nothing in the way of a separating partition between them.

The mother had an uneventful postpartum course. Her serologic test for syphilis has been checked and found to be negative. She stated that it had always been negative.

The twin female babies were examined by Dr. J. A. B. Lowry, of Crewe, Virginia, and by the author and found to possess the following characteristics:

A.—The babies were alike in the following respects:

1. Each weighed four pounds. 2. Each possessed two erupted upper central incisor teeth at birth. 3. Both babies were found to have lumbar spina bifida with myelomeningoceles. The entire lumbar region was involved in both babies, but the spina bifida defect was confined to the lumbar region. The spina bifida sacs were approximately seven centimeters in diameter at birth. 4. Both babies were afflicted with a spastic paralysis of both lower extremities. 5. Both twins passed urine and feces.

B.—The babies were different in the following respects:

1. Baby number one possessed two thumbs on the right hand only. The two thumbs were placed on

*This paper has been approved for publication by the Surgeon General of the U. S. Public Health Service.

Dr. H. H. Newman has contributed much information which has been useful in preparing this report. Mrs. Ruby A. Watkins, R. N., Public Health Nurse, brought this case to my attention and helped in securing material here presented.

the lateral side of the hand. Both contained bone and both possessed nails. The most lateral thumb was slightly larger than the medial one.

She would take neither formula nor breast and expired 36 hours following birth.

2. Baby number two had a normal formation of fingers and toes. She took formula freely but expired 60 hours following her birth.

COMMENT

It is extremely unfortunate that the membranes, placenta, and babies in this case were not preserved as they would have been very useful in the study of the anomalies here presented.

This case has been discussed from the genetical point of view in another publication.[5] In this paper we are chiefly interested in the medical aspects of the case.

In this case there was no doubt about the twins having originated from one egg since they not only fulfilled the qualifications as set up in the criteria for the diagnosis of one-egg twins by the similarity method, but the diagnosis was made even more definite by the examination of the placenta and its membranes. However, since the babies were contained in a single cavity and there was not the usual wall of two layers of amnion separating them in utero, we must consider them unusual. Holzapfel found 44 cases reported in which this condition was present.[6] In the seventeenth century Viardel wrote of this condition which he said was usually present when the twins were the same sex; but if the twins were of different sexes there would be a partition of amnion separating them. He thought Providence took this means of guarding their morals before birth.[7]

During the short time these babies lived the possibility of correcting the spina bifida was considered. Since the parents were insistent that everything be done which might remedy the condition of the twins, they were seen by Dr. J. A. B. Lowry who advised against any surgical measures. Since these babies both had a spastic paralysis of the lower extremities they probably would have profited little by surgical treatment if they had lived; and so we can say that it is probably fortunate that they did not survive longer than they did.

It would be profitable for us to consider the possibilities in regard to the etiologic agent which may have been responsible for the production of spina bifida in these children. It is generally agreed that spina bifida is due to a developmental arrest in which the neural tube does not completely close; however, it is difficult to separate the etiology of the spina bifida from the cause of twinning itself in light of the work of Stockard with the minnow, Fundulus.[8] It is remarkable that spina bifida is not encountered more often in twins since both spina bifida and twinning are thought to be due to developmental arrests.

Hertwig has made several contributions in the experimental production of spina bifida in frogs.[9] At first he thought the anomaly resulted from polyspermia but later concluded that the abnormality could be produced in any embryo by altering its normal environment.

Mall studied human embryos obtained from endometritis cases, from tubal pregnancies and other types of abnormal conditions. He found a high percentage of defects such as spina bifida in these embryos.[9] He felt that the abnormality was due to faulty implantation of the egg in the endometrium, since the percentage of malformations was much greater among embryos from tubal pregnancies than among those from uterine pregnancies. He concluded that spina bifida was caused by the action of some outside influence on the egg after it was fertilized. On the basis of Mall's findings, some physicians have concluded that any woman who has had a pathologic pregnancy should be advised to undergo a thorough gynecologic examination and possibly have a curettage before subsequent pregnancies. We may have at least a partial answer in regard to the cause of the spina bifida in the twin pregnancy here described. The mother of the twins had experienced a stillbirth eighteen months before the present delivery; and there had been no intervening pregnancies. The abnormality may have resulted from a faulty implantation of the fertilized ovum in the endometrium. It will be of interest to watch this woman in future pregnancies.

There are diseases which play a role in the production of developmental defects. This is especially true of syphilis;[10] however, this patient had a negative serologic test for syphilis at the time of the twin births and had never had symptoms, signs or findings indicative of this disease.

Polydactyly has been reported as having occurred

in one-egg twins, but the cases have all presented an extra little finger or little toe. None of them have possessed extra thumbs, neither have any of these cases been discordant in regard to this anomaly.[5] In other words, the cases of twins with extra digits which have been reported previously have possessed extra digits on both hands or both feet of both twins.

SUMMARY

A case has been reported in which a pair of one-egg female twins were afflicted with lumbar spina bifida and myelomeningoceles in identical locations and to the same extent. The physicians who saw the infants considered the condition to be inoperable. Both babies had a bilateral spastic paralysis of the lower extremities.

One baby was found to have on the right hand a well developed extra thumb, which contained bones and possessed a normal appearing thumb nail. No food was taken by this twin and she expired 36 hours after she was born. The second baby had the usual number of digits on her hands and feet. She took formula freely, but she expired 60 hours after her birth.

Each baby possessed two upper central incisor teeth. This abnormal condition may have been caused by the babies being born several days after the end of the nine months period.[5]

Some theories and possible explanations as to the etiology of the abnormalities have been presented.

This case is of interest because it presents several abnormalities which have not heretofore been reported. It is hoped that from the study of these twins, physicians will be stimulated to consider measures which might prevent the conditions found here from occurring in other cases.

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Fainting During Blood Donation Has No Serious Significance.

"Fainting which may occur in blood donors during the bleeding procedure," *The Journal of the American Medical Association* for May 6 says, "does not have a serious significance. The symptoms are distressing nevertheless. In four blood centers in England the incidence of fainting was relatively small, averaging about 5.5 per cent of the total number of over 5,000 donors. The data collected from 362 blood donors who fainted during the bleeding procedure were studied in comparison with those of 335 unselected donors who did not exhibit subjective or objective symptoms. Evidence was not obtained that factors such as age, occupation, length of wait at the center before bleeding, difficulties in bleeding, length of time since the last meal and presence of menstruation assumed any contributory role in producing or facilitating fainting. Sex appears to be a relatively significant factor in influencing the incidence of fainting. Symptoms were more frequent in women, especially in single women, than in men. Actually the only finding susceptible of control was that a high proportion of donors who fainted gave a history of fainting at previous bleedings or on some other occasions not related to blood donation. This suggests that, whenever possible, these persons should not be used as blood donors. Better and more complete knowledge of the neurocirculatory disturbance and reactions elicited by bleeding is necessary in order to devise controlling measures for the associated symptoms."

DEMONSTRATION OF TUBERCULOUS BACILLEMIA

A Comparison of Guinea Pig Inoculation of Whole Blood and Sediment Concentrated by the Loewenstein Method

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A detailed study of bacillemia in experimental tuberculosis, undertaken by the author,[1] raised the question of the relative value of concentration methods as opposed to direct injection of blood into guinea pigs, for demonstration of tubercle bacilli.

The literature contains many references to comparisons of guinea pig inoculation and culture methods. Loewenstein[2] redirected attention to culture methods, with a concentration method designed to remove hemoglobin prior to inoculation on an egg medium designed by him. Other investigators, while admitting the value of his medium, have been unable to confirm his results. The subject of tuberculous bacillemia has been critically reviewed by G. S. Wilson,[3] who concluded that animal inoculation is more sensitive than culture methods for demonstration of tuberculous bacillemia. A similar conclusion has been reached by most other investigators including Saenz, Costil and Sadettin,[4] who reported that guinea pig inoculation gave 20 per cent to 35 per cent more positive results than culture by the Loewenstein method. This difference they attributed to the many manipulations of the Loewenstein method which probably decreased the number of tubercle bacilli. However, Saenz and Costil [5] in an earlier paper reported that guinea pig inoculation and culture methods for tubercle bacilli gave corresponding results down to a dilution of $(2x10)^{-6}$ corresponding to a dose of 20 tubercle bacilli.

Most of the controversy has centered about the relative merits of animal inoculation and various culture methods. I have found no reports comparing the results of direct inoculation of whole blood into guinea pigs with inoculation of sediment treated by the Loewenstein concentration method. It seemed important to do this in order to determine whether the various manipulations of the concentration appreciably decrease the number of tubercle bacilli in the specimen.

Accordingly a dog was injected intravenously with 7.0 mgm. of virulent human strain tubercle bacilli (H37) in a suspension of kaolin, mineral oil, and saline. Daily femoral arterial punctures were performed, withdrawing 6 to 8 cc. of arterial blood. Half the amount (3 to 4 cc.) was immediately injected subcutaneously into the groin of a guinea pig. The other half of the blood sample was citrated and treated by the Loewenstein method [2] for removal of hemoglobin and concentration of the sediment.

The procedure of concentration was as follows:

(1) The citrated blood specimen was centrifuged for 30 minutes and the supernatant plasma decanted.
(2) 25 cc. of sterile distilled water was added, mixed thoroughly, again centrifuged for 30 minutes and decanted.
(3) step (2) was repeated.
(4) 2 cc. of 15 per cent sulphuric acid was added and the tube shaken, centrifuged, and decanted.
(5) 25 cc. of sterile distilled water was added, mixed, centrifuged and decanted as above.

The resulting sediment was suspended in a small quantity of distilled water and injected subcutaneously into the groin of a guinea pig.

All guinea pigs gave a negative reaction to tuberculin intradermally at the time of injection. A total of 48 guinea pigs were injected, divided into 24 pairs. Guinea pigs were sacrificed and necropsied after 1 to 4 months and the presence of tuberculosis evaluated on the basis of the typical gross and microscopic findings of injection tuberculosis, confirmed by positive intradermal tuberculin reaction and stains for tubercle bacilli. Blood was drawn daily except Sunday, for four weeks. The extent of the tuberculosis found grossly in the guinea pigs was graded on a basis of 1 plus to 4 plus, which was considered to give a rough measure of the number of bacilli present in the particular blood sample. The results are tabulated in table I.

TABLE 1

EXTENT OF TB. IN G. PIGS INJECTED WITH:

DATE	WHOLE BLOOD	LOEWENSTEIN SEDIMENT
April		
6	dog injected with suspension of tubercle bacilli	
8	3+	3+
11	2+	1+
12	2+	0
13	3+	0
14	4+	0
15	2+	0
16	2+	0
18	0	0
19	0	0
20	3+	1+
21	2+	0
22	0	2+
25	2+	0
26	0	0
27	0	0
28	2+	0
29	0	0
30	0	0
May		
2	0	0
3	0	0
4	0	0
5	2+	0
6	0	0
7	0	0

RESULTS

Of the guinea pigs directly injected with the whole blood, 12 of 24 showed tuberculosis graded from 2 plus to 4 plus. The guinea pigs injected with a sediment of blood concentrated by the Loewenstein method showed tuberculosis graded from 1 plus to 3 plus, in 4 of 24 guinea pigs. One guinea pig died of intercurrent infection in less than one month after injection and therefore cannot be positively classified as negative, although the corresponding animal injected with whole blood showed no tuberculosis.

In 8 specimens of 24 the whole blood injection method detected tubercle bacilli which were not demonstrated by the injection of sediment from the blood sample treated by the Loewenstein method.

In 1 specimen of 24 the Loewenstein method showed the presence of tubercle bacilli not detected by the injection of whole blood.

In 3 specimens, the tuberculosis was more extensive in the guinea pig injected with whole blood.

DISCUSSION AND CONCLUSIONS

Using an equal volume of blood, direct injection of whole blood into guinea pigs was about three times as sensitive in detecting tubercle bacilli as was injection of the sediment after treatment by the Loewenstein method. It may be significant that the numerical difference in sensitivity of the two methods is the same as the number of washings and centrifugings. If the volume for concentration were three times as great as that for direct injection, one might expect approximately equal results. It was impracticable to test this theory however, because of the large amount of blood necessary.

The inference is strong that the loss of tubercle bacilli occurs in the washing and centrifuging, and the reduction in number of bacilli is directly proportional to the number of washings. This would tend to confirm the suggestion of Saenz, Costil and Sadettin[4] previously mentioned. It is of interest that Schwabacher[6] has been able to culture tubercle bacilli in about equal numbers from the supernatant plasma and from the sediment in blood from tuberculous animals treated by the Loewenstein method.

It may be concluded that the volume of the blood sample is the chief factor in determining whether concentration methods may be advantageous in a given case. In order to show any advantage for concentration methods, a blood sample of 20 cc. or greater would be necessary.

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GEORGE BEN JOHNSTON AND LISTERISM*

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In March, 1879, Listerism—the so-called newborn science of modern surgery—received its introduction to the Virginia medical profession. Its arrival was unheralded. It came suddenly, without fanfare, or benefit of general professional acclaim. Quite the contrary. Among Richmond operators, the lone sponsor of Listerism in that earliest, portentous hour was Dr. George Ben Johnston, an enterprising young newcomer from Southwest Virginia.

He was twenty-five years old, and had lived in Richmond less than a year, having moved here after one notably successful year of country medical and surgical practice in and around the town of Abingdon.

Listerism was a bold departure. Its pioneer technique was awkward, time-consuming—to some, even laughable; but to the keen mind of his first Virginia partisan the great English surgeon had built soundly, inescapably, upon "the germ theory of putrefaction", as laid down in 1857 by the French chemist, Louis Pasteur. Listerism in Virginia would shake the whole citadel of Confederate medicine and surgery. Its fearless and devoted adoption by an unknown youngster from the provinces would not endear him to his established colleagues. In the new Dr. Johnston, these conservatives had also to reckon with the most formidable personal charm, the most brilliant mind and magnetic spirit to enter their profession in many days.

Richmond was not alone in its reluctance to follow the new star of Joseph Lister's troublesome antiseptic method. This was long before a modest man, late of Edinburg, was named "Lord Lister" by his grateful Queen. Eighteen-seventy-nine was only a dozen years from Lister's first epochal report of a small series of compound fractures—13 cases in 18 months—with only two deaths and two cases of "hospital gangrene", both of which recovered. It was only nine years since Saxtorph, Professor of Surgery in the University of Copenhagen, gave his first "outside testimony" to Lister's antiseptic system. It was less than three years since Von Nussbaum in Munich, having transformed the appalling conditions of his State-hospital there by "the sternest and minutest Listerian regime" had published his tribute to "Lister's Great Discovery"; this, the first statistical proof of the results of antisepsis, appeared in the *German Journal of Surgery* for October, 1876. Richmond, like Joseph Lister's native London, like many medical centers here and abroad, was largely unmoved—or frankly hostile to the "turning-point in all surgery". Recent political miseries of Reconstruction, and the ghastly glories of Confederate surgical defeats were of greater moment still—to many surgeons, if not to their patients.

But, thanks to Dr. George Ben Johnston, Virginia ranks well in American surgical history. The year 1879, in which Dr. Johnston became our pioneer "dispenser of the benefits of antiseptic surgery", is also well known in medical annals as "the decisive year in the history of Listerism". It is the year "from which the final acceptance of the antiseptic system may be dated"; the year of Lister's first great international triumph, his reception at Amsterdam "with an enthusiasm that knew no bounds" by the triennial International Congress of Medical Science. Working in another world, with equal enthusiasm and inspired confidence, with a passion for truth and a genius for leadership, young George Ben Johnston had brilliantly placed his native State in the van of revolutionizing medical progress.

Dr. Johnston's early assumption of a great preeminence was no accident. His prompt grasp of the profound significance of Lister's work was characteristic of his own intellectual calibre. It evidenced in him the flowering of a long and noble heritage, from men and women of courage and able minds. He stood on the threshold of his great career endowed with many gifts, not the least of them the blood of illustrious forbears quickening his own.

Back to the thirteenth century, to a Scottish town on the English border, goes the authentic record of "the brave and powerful Johnstone family". Back to Sir John de Johnstone, Marquis of Annandale and Lochwood Castle, whose resounding title, "Warden of the West Marches" was given him by the

*_Revision_ of presidential address before the Tri-State Medical Association of the Carolinas and Virginia, published in *Southern Medicine and Surgery*, March, 1944.

king of Scotland. Sir John's broadly defined duties were simply "to defend Scotland against the inroads of the English". For 400 years, from that doughty warrior, his Scottish line is studded with Johnston soldiers, scholars and—always—patriots. Finally, in 1727, his descendant Peter Johnston, an able and interesting young man of the Annandale family, emigrated to Virginia. At home he had a friend named Walter Scott, whose namesake would some day write the Waverly Novels.

In Virginia, where he had settled first on the lower James River, the first Johnston grew rich and prominent in the merchandising trade. He married late, and moved up-country to Prince Edward County. His home, near the town of Farmville, is known today as "Longwood"—or the Farmville Country Club. But Peter Johnston's great-grandson surmised in writing his family annals that the name was "a corruption for 'Lochwood'," the ancestral 13th Century Castle left behind in the West Marches of Scotland. Besides a notable posterity, Peter Johnston's enduring monument is Hampden-Sydney College to whose founders he gave one hundred acres of land on which to build it. He was progenitor of many distinguished Virginians, none worthier of their country's honor than the courageous great-great-grandson whose pioneer service to Southern surgery I present to you today.

In the three intervening generations of Dr. Johnston's direct line in the Cincinnati Society stands first, Judge Peter Johnston son of the immigrant. Born in 1765, he is the family hero of the American Revolution, the "blue-eyed, curly headed boy" of intrepid courage and patriotism, who slipped away from Hampden-Sydney—pursued in vain by parental and college authorities—to become a lieutenant in "Lee's Legion" at sixteen. His company ranks included the legendary Virginia giant, Peter Francisco. After the war Captain Johnston became a distinguished lawyer, orator, statesman. He was an ardent follower of Jefferson and Madison, the "Great Republicans", as democrats of their day were called; and in 1788 he married Miss Mary Wood, a niece of Patrick Henry. As Speaker of the Virginia Legislature he helped notably to pass the famous Resolutions of 1789. In fact, Mr. Johnston's speech in favor of The Resolutions was deemed so good it was published in *Niles Register,* the leading magazine in America. In 1810 Peter Johnston was elected a judge of the General Court. But he exchanged circuits with his friend, Judge Brockenbrough, who "preferred to stay East", and moved to Abingdon. Thus the Johnston family became identified with Southwest Virginia.

Dr. John Warfield Johnston, born in 1790, oldest son of Judge Johnston and future grandfather of the great modern surgeon, was himself a young man of great abilities and promise, and also, it is said "of charming manners and temper". To study medicine, his father sent him to Philadelphia, considered then the finest medical school in America. He returned to practice in Abingdon; and married Miss Louisa Smith Bowen of Tazewell County. But the diary of his son relates that "he died before he was 28 and yet, in that short period, he had acquired a reputation equal to that of a successful practitioner of fifty". He died for others, victim of "an epidemic disease then very fatal in the country", which he contracted while attending his stricken neighbors.

The second John Warfield Johnston, who became the father of George Ben Johnston, also grew up in Tazewell County, Virginia. At 8 he entered Abingdon Academy, where for six years he says, "I distinguished myself more as a bandy-player than any other way." At 15, he rode horseback 350 miles to enter South Carolina College at Columbia. Afterwards, he studied law at the University of Virginia and, on October 12, 1841, he happily married Miss Nicketti Buchanan Floyd, daughter of the ex-Governor of Virginia. The young couple began life in Jeffersonville. From Commonwealth's Attorney "at the magnificent salary of $100 a year", Mr. Johnston rose rapidly to State Senator, and local Bank President, to leading lawyer and outstanding citizen of that region. After the War Between the States he was one of the two first representatives from Virginia to be re-admitted to the United States Senate. He was re-elected twice, and states quietly that "it has always been a source of great satisfaction to me, that in all three elections, I never lost one vote in my own section of the State—the great Southwest. I uniformly received every vote, west of Lynchburg."

Mrs. Nicketti Floyd Johnston, had two older brothers of already distinguished names. They were George Rogers Clark and Benjamin Rush Floyd; and for them her third son and seventh child would be named "George Benjamin" at Jeffersonville, on July 25, 1853. Mistress Johnston's own odd Christian name bore no reference to the bold Indian blood

claimed proudly by her father. But, as she could tell you, names were scarce when the youngest of twelve, and a seventh girl, was born in Burkes Garden in 1819. One day a great friend of her father's came magnificently to their home; an Indian, of un-savage bearing, who stopped near her cradle.

"Nicketti-nicketti—" he said gently, which, being interpreted, means "pretty baby" . . . and thus a new Floyd-family name was coined.

Of the young lady herself, her husband's record states proudly that "her appearance was very striking. Her hair, then a very dark brown, curled naturally and was worn in ringlets. . . ." A country girl, she could ride and shoot well and fearlessly; she also knew and loved the beauties of her noble countryside. She was gay and "sympathetic" and charming and deeply spiritual. And she had a way of nursing the sick ". . . walking a mile out of town . . . to sit up all night—night after night—with a sick family." Later, during the war years, she "devoted several rooms to a hospital for sick soldiers". We see a small eager boy, who loved his mother, deeply impressed by the hospital in his own home, and by her ministry to and interest in the victims of disease and wounds.

Mrs. Johnston's flair for helping sick people was already inherited. Her father, Dr. John Floyd, twice Governor of Virginia, had begun his medical studies in Louisville in 1802 with a Dr. Ferguson of that city. Three years later he went to Philadelphia to complete his training under a greater teacher. Besides his vast practice and constant "lecturing", Dr. Benjamin Rush of the University of Pennsylvania had found time to be a statesman. John Floyd's career would emulate that of his famous preceptor. During the War of 1812 he left his already large practice to serve as surgeon in the Army. Returning, he settled at Thorn Spring in Montgomery County, and from there "for his prominence and abilities" he was elected to Congress. He served continuously for 18 years. In 1828, the unhappy year of "Nat Turner's" dark fame, Dr. Floyd became Governor of Virginia. For his wise and able handling of that grievous business, he was returned to office. It is written of Dr. Johnston's grandfather that he "was a remarkable man in all respects. . . . As a Doctor he had no superior, and as a public man was most conspicuous, during a period very fertile of great men."

But by far the most colorful career in our great surgeon's tremendous heritage was his maternal great-grandfather, the first John Floyd. He was second of his name in the New World—his father, William Floyd, having emigrated from Wales to the Eastern Shore of Virginia. John Floyd was born in 1751 in the "wild region" of Amherst, Virginia. From his Indian maternal grandmother this bold and virile pioneer inherited useful traits for the life of violence and adventure that lay ahead. He married first at 18, but his wife died in childbirth. The bereaved infant daughter was duly named "Mourning" Floyd. Briefly, thereafter, John Floyd became a school-teacher and writer in a surveyor's office. In 1775 he visited and surveyed a great tract of lands in Kentucky, whence he returned safely "after unparalleled suffering", and shortly afterwards won the promise of beautiful Miss Jane Buchanan. But a war intervened. As skipper of the Privateer *Phoenix*, returning with a rich prize from the West Indies, John Floyd was captured during the Revolution by a British warship. He was put in irons and imprisoned in London; but the jailor's daughter helped him escape. In Paris, where the refugee had barely survived an attack of smallpox, the American Minister, Dr. Benjamin Franklin saw him safely off to the United States. With a scarlet wedding-coat, and silver shoe-buckles for his betrothed, he got back in time to marry her—the day before she, thinking him lost, would have wed his rival! In 1779, taking his family, Col. John Floyd led a group of Virginia pioneers to settle a vast principality in the little-known "dark and bloody land" of Kentucky. The place was named Floyd's Station, and the lands are now a part of the city of Louisville. In his own words he had "set foot upon the threshold of an empire". A giant in strength and courage, Col. Floyd survived many personal encounters with the Indians. But he lost his life, wearing his scarlet coat through the forest near Louisville, in 1783. His third son, John, the little Kentucky-born future governor of Virginia, began life 12 days after his father's death.

This survey of Dr. George Ben Johnston's direct lineal ancestry is vital to our study of the man himself, and his great contribution. We find the pattern of his brilliant personality set in noble fabric. His keenness of intellect, his extraordinary abilities, his integrity, courage and enterprise, besides his compassionate interest in human suffering, and a vital concern for the public good—all these fine

qualities were his by inheritance. They were "in his blood", uniquely his own like the bright curling hair that framed a splendid brow, like the powerful physique of the best wrestler at Abingdon Academy, where his father was the outstanding "bandy-player" years before him.

As a boy Ben Johnston was "a fair student", not so good as his elder brother Willie. But Willie, who was lamentably drowned during their first college year together in Wheeling, West Virginia, was "Confessedly the best scholar; and the best, the Professors said, they ever had." After two years at St. Vincent's, also known as "Bishop Whelan's School", Ben took the collegiate course at the University of Virginia; and for one year there his father "put him to the study of the law". But "he did not take kindly to it, and indicated a very strong inclination to medicine". Seventy years later, Dr. Johnston's sister remembers that "he did try to study law to please his father, but he always wanted to be a doctor—and a good thing too!" Once in medicine, the young man hit his stride as a student. "At the end of the session", writes his father, "he was elected Final President of the society to which he belonged—the highest honor and greatest compliment the students can pay a fellow-student."

From the University of Virginia Ben Johnston went for his final year of medical study to the Medical College of the City of New York. He received his degree there in 1876.

Interesting is the visit of Joseph Lister to Philadelphia and New York in that same year. Did his coming focus the fertile mind of his first Virginia follower on the great Englishman's enormous discovery? Was young Johnston present, that October day at the Charity Hospital in New York, to see and hear for himself an address entitled "The Antiseptic Treatment of Open Wounds?" If he was not there in person, certainly many of his former fellow-students did attend that momentous presentation, or the one in Philadelphia on "Antiseptic Surgery"; so we may be sure that the future Richmond surgeon was directly influenced by the founder of Listerism. The great new word fell on good ground in the receptive mind of George Ben Johnston. In an amazingly short time it would bring forth its fruit there, an hundred-fold.

If all operators may be judged by their "end results", the earliest surgical work of Dr. George Ben Johnston, without a fatality during his first year of practice, is an impressive record. I quote his father:

> "He only remained in Abingdon a little over a year, but in that short time acquired a great reputation as a surgeon. The principal operations performed by him were: one in Russell County upon a man who had suffered for some years with an obstruction in the throat; this Ben removed and the man got well. The other was the amputation of both legs of a brakeman whose feet had been mashed in an accident and who also got well."

In 1877 Dr. Johnston's decision to move to Richmond was heartily endorsed by his parents, "as giving him a better and larger field for the talents they believed him to possess". They recognized the early evidence of his genius and fostered it. Already his father's advice had proved the turning-point of a noble life. After graduating in medicine Ben Johnston received two attractive offers, one to settle in New York, one in Philadelphia. With filial affection and respect he consulted his father.

"Virginia needs her sons," said Senator Johnston, "You should come home to practice your profession."

Now, at the State Capital, the Virginia profession of medicine witnessed a strange and perhaps not too welcome phenomenon—the immediate, startling success of a new arrival: a full-fledged master surgeon, suddenly taking his place in their front ranks. He had not come gradually into surgical prominence from years of urban general practice. Within a single year he had fearlessly and firmly established himself as a master in the art and practice of modern surgery.

In later years Dr. Johnston admitted that he had decided never to let himself be known as "the young doctor". Youth, he knew, was no asset to a surgeon opening his practice in a strange competitive city. But a surer key to Dr. George Ben Johnston's instant and singular success was his masterly comprehension and meticulous application of the new phrase, "antiseptic surgery".

One spring evening in March, 1879, Dr. Johnston told his mother and sisters that he had a very serious operation to perform the next day, for the first time, and he wanted them to be praying for him. At eleven o'clock next morning, Mrs. Johnston and her daughters knelt devoutly at home, with their rosaries; for them, the beads slipping through their reverent fingers were symbols of sterner instruments in the skilled hands for which they prayed.

Meanwhile, at some antique Richmond hospital, with strict new Listerian antisepsis, Dr. Johnston was successfully removing an ovarian tumor weighing forty-five pounds. His one approving friend and assistant that historic morning was his kinsman, Dr. Frank Cunningham, whose name alone shares this bright page of Virginia surgical annals with Dr. Johnston's. The patient recovered without infection; and the news of that miracle, and of others that followed it, spread rapidly through the state and nation, as the marvelous skill of Dr. George Ben Johnston became a by-word in Richmond, Virginia.

On October 12, 1880, at home in Abingdon, he married Miss Mary McClung, "a sweet and lovable young lady", from Tennessee. But in less than a year she was dead of typhoid fever. "After her death", writes his father, "he went home with me to Eggleston and spent some time"—poignant inference to shock and sorrow. But soon Dr. Johnston had steadied his fine heart, and turned back to his active and growing surgical practice in Richmond.

Twelve years later he married Miss Helen Coles Rutherfoord of Rock Castle, Virginia. She was a charming girl, of distinguished heritage, and with her he now entered upon a lifetime of private happiness in a home of princely hospitality.

Even in the spacious days of "Old Richmond's" happy and leisurely social life in the nineties, the Johnstons' home at 407 East Grace Street was noted. It was famous always for the grace and charm of its host and hostess, and for the constantly recurring groups of distinguished guests who gathered there. Fabulous stories of Mrs. Johnston's matchless "table" live on through sterner times. Her wit and sparking conversation were never over-shadowed by her brilliant husband. She amused and delighted him; for he knew and shared her vital interest in all the arts of living well and graciously.

The years passed busy and work-filled. In 1885 he had been elected Professor of Anatomy at the Medical College of Virginia. In 1888 he resigned at the end of the session, "finding that the duties of his place interfered too much with his practice". But Dr. Johnston's earliest affiliations with the Medical College of Virginia were but straws in the wind of a life-long devotion to and ennobling influence upon medical education. It is interesting that in 1893 he was made Professor of Didactic and Clinical Surgery, but accepted the appointment only "on condition that a properly equipped teaching hospital under the control of the College be established". The first hospital, therefore, that owed its existence to Dr. George Ben Johnston was The Old Dominion Hospital, adjacent to the ancient Egyptian Building of the Medical College in Richmond. It was the first modern "teaching hospital" ever established in Richmond.

Dr. Johnston's surgical work in the '90's and early 1900's commands our full respect today. I present to you one series: a report of three cases of cancer of the cervix complicated by pregnancy. All cases were beyond the fourth month; on two of them he did a pan-hysterectomy on recognition. The third case was allowed to go to term. A live baby was delivered by Caesarean section, and a complete hysterectomy was done. All three cases had complete operative recovery, and the follow-up showed them to be cures. With all our improved surgical procedures few of us today would under-estimate the magnitude of this type of surgery.

Within one five-months' period during the same decade, a report from the Old Dominion Hospital shows that Dr. Johnston performed 71 abdominal operations there. They were: 18 appendectomies, 7 appendiceal abscesses, 2 nephrectomies, 1 nephrotomy, 4 operations for hernia, 3 of them double, 8 salpingo-oophorectomies, 1 hepatotomy for abscess, 12 hysterectomies, 1 exploration of tuberculous peritonitis. There were only two deaths in this series; one of them in a case of suppurating appendicitis, the other in tuberculous peritonitis.

A partial bibliography of Dr. Johnston's reported work during this period includes the following titles: Gastrostomy for Traumatic Stricture of the Esophagus, Report of Case, (1890), Report of Two Successful Nephrectomies (1890), Imperforation of the Rectum (1891), On Movable Kidney (1894), Diagnosis and Treatment of Cholelithiasis (1895), Splitting the Capsule for the Relief of Nephralgia (1896), Comparative Frequency of Stone in the Bladder in the White and Negro Races (1896), Acquired Umbilical Hernia in Adults (1897), Symptoms and Treatment of Hepatic Abscess, with Report of 17 Cases (1897), Retro-perineal Fibrolipoma, Some Abdominal Cases (1898), Progress of Renal Surgery (1898), The Limitations of Conservative Surgery of the Female Generative Organs (1899), Report of a Case of Uretoro-ureteral Anastomosis (1902), A Case of Bilateral Diffuse Virginal

Hypertrophy of the Breast (1903), A Case of Uterus Dydelphus (1904).

The scope of Dr. Johnston's practice is indicated by such reports; his brilliant discussions on the work of other surgeons shed further light on an immense versatility. In discussions before the Southern Surgical and Gynecological Association, alone, he is recorded on "appendicitis", "aseptic surgical technique", "cholelithiasis", "rectovaginal fistula", "splenectomy", "fibroid tumors of the uterus", "ovarian cyst", "post-operative complications in abdominal surgery", "prolapse of the rectum in women", "surgery of the bladder".

We may also remember that in this fertile period of a great career, "general surgery" included many operations now the province of the consulting specialist. Besides his tremendous work in abdominal surgery and gynecology, Dr. Johnston was long his own orthopedist, his own neurological surgeon.

In all Dr. Johnston's forthright opinion recorded for us on the current surgical problems of his day, we note an interesting fact. It is a proof of his genius. Rarely, if ever, had he cause to reverse himself. He was consistently *right,* as in his pioneer work in asepsis, from his earliest words on the fundamentals of modern surgery. Many of his statements, daring and provocative when he made them, are axiomatic today: "The essential thing is the proper preparation of the patient preceding operation." "The minimal amount of the anesthetic agent and briefest possible time in administering it." "In regard to complications, the most important thing is prompt recognition of them . . . they must be quickly diagnosticated and energetically treated." "Among all practitioners, for any bowel trouble in very young children they try to clean out the bowels with a dose of oil. I look upon this as a pernicious practice . . . and I think it is our duty to preach a crusade against purgation in acute abdominal conditions." "In my experience (with Dilatation of the Stomach) . . . after the first thorough lavage the slightest amount of vomiting is an indication for second stomach-washing, and this should be continued as long as there is any vomiting." "The treatment should be governed not so much by ourselves as by the action and condition of the patient." "Surgical daring is a matter of the *when* and not the *what*."

These are the pronouncements of a wise philosopher, and thoughtful man, who was also a master clinician.

In a discussion of a paper on "Aseptic Surgical Technique" in 1895, Dr. Johnston said, "I am convinced along with Dr. McMurtrie that the greatest source of danger to the patient is through the surgeon and his assistants." In his own paper on "Movable Kidney" that year he concludes, "Nephrorraphy is not indicated in every case of dislocated kidney, but only in such cases as manifest distressing symptoms."

Notably discerning is Dr. Johnston's discussion, also in 1895, of appendicitis in the Negro. He observes that when the Negro is eating in his master's kitchen, appendicitis is common. When he is living in the rough he has no digestive disturbances and appendicitis is infrequent. And, more seriously, "Negroes are mostly in the hands of less capable practitioners of their own race; therefore, they do not get as good medical attention as whites, and many cases of appendicitis in the Negro are overlooked."

In 1896, at the ninth annual meeting of the Southern Surgical Society and the year he was elected president of that body, Dr. Johnston discussed appendicitis. He said, "Every case of acute appendicitis should be operated on as soon as the diagnosis is made, during the first 48 hours. After 48 hours, one should be governed by the severity of the disease and the general condition of the patient. If an abscess has developed, drain the abscess but make no effort to remove the appendix, unless it is in the operative field." We should do well to follow this advice today.

"A physician", he adds, "in my opinion has but one duty in the matter of dealing with appendicitis, and that is to call in a surgeon of experience and not undertake to treat cases medically."

As tenth President of the Southern Surgical Society in 1897, Dr. Johnston selected for his presidential topic "The Prevalence of Specialism and Who Shall Be Specialists". In a brilliant analysis, he divides the specialists of his day into two classes, the true and the pseudo-specialists. The true specialist is a man especially distinguished for his learning and skill in a given pursuit. The false, is one having merely a special occupation. Dr. Johnston firmly believed that a specialist should be a doctor of real learning, a man of broad medical education, who should be able to discuss medicine and surgery intelligently when called in consulta-

tion. Above all, he must have proved himself efficient in the practice of medicine. The author had in mind the giants of his profession in that day; men who were "broad, learned and wise, owning a mine of experience which fitted them for the high calling of 'specialist'." "To fix the standard and lay the proper requirement for specialism, the colleges and societies must act," added Dr. Johnston. ". . . that the public may know the specialist is sanctioned by a proper body qualified to judge his fitness to execute the work he seeks." Fifty years later, there is evidence that Dr. Johnston's timely discussion of specialism had a beneficent influence on the course of our profession.

With the turn of the century, Dr. Johnston's nation-wide fame was already immense. At fifty-one he was elected President of the American Surgical Society, and he already seems to have received every honor in the gift of his profession in the United States. His local, State and Tri-State medical societies, the Southern Surgical Association, the American Surgical all conferred on him their highest offices. As invited guest he appeared on distinguished programs of surgical societies as far apart as Boston and the Mississippi Valley. He was the beloved and honored friend, and peer of the leading men of his day, ever welcomed into the hierarchy of the great in surgery.

Even so, Dr. Johnston's chief influence on the medical profession stemmed from his constant interest in and loyalty to the welfare of his home city and its medical institutions. In 1903, the year of his election to the International Surgical Society, he secured from his friend, Mr. John L. Williams, of Richmond, a memorial gift of $200,000 to found an adequate teaching hospital for charitable purposes, in connection with the Medical College of Virginia. For many years, the Memorial Hospital was the finest in the south, a model of all that was newest and best in modern clinical facilities. Dr. Johnston was also instrumental in founding Richmond's excellent hospital for negroes, St. Phillips.

Dr. Johnston's lifelong service to the Medical College of Virginia is worth recalling to every alumnus of that institution. Prior to 1893 the medical school offered only a two-year course; it had no hospital; and not more than three clinics a week were held; these were mostly "walking cases" from the Dispensary. In that year, thanks to Dr. Johnston's refusal to accept a chair in surgery there unless better clinical facilities were provided, ours became the first medical school in Virginia to offer and require four years of medical study for a degree. From then on, Dr. Johnston always insisted upon the highest possible standards both in the teaching services and in equipment for the Medical College. He secured a State appropriation for it from the Legislature, and ever afterwards successfully defended that appropriation against all comers. Certainly he was no orator; his voice was rather too high-pitched, and lacking in resonance, but when Dr. Johnston rose to speak before any assembly, scientific or otherwise, his arguments were more than convincing; they were unanswerable. His words carried authority as the eloquence of few men could do. When he differed from his opposer in a discussion, he spoke with a gracious formality, an urbane courtesy that only enhanced the cutting irony and convincing logic of his argument. So the records prove that whoever brooked the self-less force of Dr. George Ben Johnston's tremendous energies in behalf of medical education in Virginia, they always did so at their peril.

In 1903, as chairman of the Legislative Committee of the Medical Society of Virginia, he sponsored the first Virginia statute governing medical practice—a law so far-seeing and effective against charlatanism that it has required few amendments during the past forty years.

But, with his keen wit and ready interest in public affairs, his championship of truth and fair play, medical politics was not the only realm that felt Dr. Johnston's fine, energizing hand. In a long-dead but ardently waged struggle between two distinguished Virginia politicians, the issue is said to have been decided in favor of the incumbent by *A Fable,* written, printed and circulated in behalf of Senator Thomas S. Martin by a well-known Richmond surgeon! I commend to you "The Fable of The Martin and The Woodpecker" as a masterly bit of strategic satire, and a fine example of its author's wit and wisdom.

Today in Richmond more than one outstanding physician or surgeon began his success with Dr. George Ben Johnston. In the quarter-century since his death, other accredited private hospitals here besides his own have been staffed by men brought here and trained for surgical leadership by Dr. Johnston. This is an important index to a noble and generous character. No motive of self-interest

impelled him to such a task; he had nothing to gain by it. He simply saw the need for more and better-trained doctors in his community of the future, in a world he would not live to serve.

His life-long interest in young men was beautiful, and rare in a great and busy surgeon. He delighted in training them; and the beginning of that training was never easy. It did not take the Chief Surgeon long to decide an interne's fate. He knew rather promptly whether you were just "run of mine" or an interne with potentialities for advanced training. Once having selected his young men, he believed in them so firmly that he soon put real responsibility on them, and backed them to the limit in that responsibility. It was hard to fail him. But woe be unto him who did not measure up to that trust!

Dr. Johnston felt that every young surgeon should have a strong foundation in medicine. He encouraged them always to spend some time, a few months at least, in the actual rigors of country medical practice, before devoting themselves to surgery. He often arranged for such temporary apprenticeships with some member of his wide circle of referring physicians. So begins many a cherished tale of youthful hardihood "in the country" as survived by Dr. Johnston's urban followers.

As a clinical teacher, Dr. Johnston had an uncanny ability to bring out the essentials and to place little emphasis on the negative findings. He went into the greatest detail in discussing his cases before, during and after operation. He was a great surgeon, a smooth operator, a dissector with few equals. And always, for any operation, there was the greatest dignity in his operating room. If there was a discussion, he led the discussion and he closed it. He was never in a hurry during an operation. Nor was he time-consuming, and he always operated with little lost motion. He wanted his assistants to anticipate every move; otherwise, he felt them to be a liability.

His most promising follower, the "assistant" whose name is linked in surgical history with Dr. Johnston's was my distinguished preceptor, the late Dr. A. Murat Willis. The partnership between these two brilliant and gifted men was happy and productive. Together, with a great clientele, they did much original work, including the well-known operation which they devised and perfected jointly, the Johnston-Willis suspension of the uterus. Together in 1909 they founded the Johnston-Willis Hospital in Richmond, located then at Sixth and Franklin Streets. Three other excellent Southern hospitals today owe their existence to the far-flung vision and enterprise of Dr. Johnston and his able young partner, Dr. Murat Willis. These institutions are the George Ben Johnston Memorial Hospital in Abingdon, Virginia, the Park View Hospital in Rocky Mount, North Carolina, and the Nassawadox Memorial Hospital on the Eastern Shore of Virginia.

Dr. Johnston's presidential address before the American Surgical Association was entitled *"A Sketch of Dr. John Peter Mettauer of Virginia."* It was typical of his passion for truth and justice, that Dr. Johnston should determine to bring before the leading surgeons of America the accomplishment of this great Southern pioneer in surgery, the man who—perhaps because he was a Southerner—had been sadly neglected or forgotten by his surgical beneficiaries. Dr. Mettauer of Prince Edward County was also a neighbor of Dr. Johnston's family some three generations back, so this writing satisfied another leading trait of the essayist: his devoted loyalty to places and people.

In his own words, Dr. Johnston presents Mettauer "in the staring black and white of simple truth . . . as one of the builders of that foundation which has made the present superstructure of medicine a possibility." He points to Mettauer's great surgical skill—"marvelous for his day and well-nigh marvelous for any day"—and, lapsing for a moment into poetic metaphor, he recalls how that great man's reputation, "growing as his fame, was spread in widening circles on the sea of human misery." But the crux of this "biography" re-established the fact that in 1838 Dr. Mattauer was the first American surgeon to cure vesico-vaginal fistula with lead-wire sutures, thus antedating Dr. Marion Sims's accepted claim to priority by many years. In 1833, Dr. Mettauer had already accomplished the repair of recto-vaginal fistula, using lead-wire. Dr. Johnston also stated that Dr. Mettauer's operation for cleft-palate was the first in the western world. And I am sure Dr. Johnston would heartily applaud Dr. M. Pierce Rucker who has lately published an original excellent work on Mettauer. Dr. Rucker concludes strongly that Sims must have been familiar with Mettauer's report in the *Boston Medical & Surgical Journal* of 1840; but Sims failed to acknowledge

that priority. Twelve years later, Rucker states, Sims ignored Mettauer's published work, dismissing the success of the first American user of the silver catheter and metal suture, to claim that signal historic honor for his own.

No man ever had more staunch friends than Dr. Johnston. In every walk of life, from his honored colleagues in all professions to his white cobbler and his negro office girl, all his people loved him with a worshipful attachment. He returned their affection. Particularly, his patients loved and admired him.

From certain doctors today we often hear this remark, "I see patients only at certain hours, only at my office." This was not Dr. Johnston's method of ministering to the sick. I have heard him say, and I know it to be true, that he never turned down a call, from rich or poor, from white or black. He always said that when he got to the point of not looking after his charity practice, he would retire. With such a spirit and such an example before us, there was no place or need for "State medicine" in that day.

No surgeon ever lived closer to the Golden Rule than Dr. Johnston.

But with all his lovable and winsome qualities, he was a man of strong convictions, and utterly fearless in expressing them. I think his pioneer spirit enjoyed opposition; for he did not believe in straddling fences; he was not to be found on both sides of any question. If ever his misguided opponents presented an argument not based on clear facts and simple truth, they were hard pressed from the beginning! In all issues it soon appeared where Dr. Johnston stood. And there he stood four-square. Particularly if the "question" concerned his friend—and if he felt his friend's cause was just, he seemed to revel in the contest. He was willing to go all the way for his friends. On the other hand, it was hard for a man to be "all things to all people" and still keep Dr. Johnston's respect and friendship. Against the rock of that clear-eyed, affirmative integrity, such a man would surely fall.

Notable tributes to Dr. George Ben Johnston are already on record; they tell the magnitude of his life and work, and the singular charm of his rare personality. Dr. Beverley R. Tucker and more recently Dr. J. Morrison Hutcheson have done him honor. There is also a just eulogy by his friend, the late W. Gordon McCabe of Richmond. To all these, I would add my personal tribute.

I remember well Dr. Johnston's striking appearance, for he was the handsomest man we knew. His hair and mustache had grown white, but his fine high-colored face was never old. He had a lofty forehead, keen brown eyes and noble features; with a smile that won and held his friends. I remember his impressive, though modest bearing; his great physical strength, and the beauty and power of his hands. I remember the warmth of his most casual greeting, and his immediate, unfeigned interest in every human being. I remember also the example of his faith and piety, and his devotion to the Church, and his courageous Christian fortitude to the last.

As his interne and resident I was privileged to spend much time with Dr. Johnston. And on two occasions, during the last years of his life, I became his traveling companion. Always such a journey was like a royal pilgrimage. Wherever he stopped, at the Mayo Clinic, in New York, Chicago, or Philadelphia, or as guest of Mr. Wilson in the White House, Dr. Johnston was the center of attraction in every gathering. He had something men liked. They delighted in him for it, although it was a quality that evades a name. They only felt the charm of an amazing yet understanding mind, of a heart's natural warmth, a geniality and courtly graciousness rarely met. Equally impressive and characteristic of him to me was his courteous consideration of his young companion. Wherever he went, however grand the function, he took me with him, with a tact and generosity impossible to describe or to forget.

When Dr. Johnston died, at 63, on December 20, 1916, he left no son to carry on his name. But his four beloved and loving daughters could always more than compensate him for such an omission of fate. Today his immortality goes on. There are 12 living grandchildren, of whom 7 are boys. In 1941, a brave and wonderfully handsome young man named George Ben Johnston Handy left his medical course at the University of Virginia to volunteer in the United States Army. He was killed on Bataan Peninsula in January, 1942, the first alumnus of V. M. I. to fall in this war, and a grandson of Dr. Johnston worthy of his illustrious name.

Dr. Johnston's own closing tribute to Mettauer is strangely applicable to the man we honor: "great he was . . . untiring, bold, resourceful, zealous, a

prodigy of his own age and a prophet of the time to come . . . a character so unique, picturesque and masterful, that if this presentation fail to interest you—*mihi defectus*—the fault is mine and not my subject's."

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The American Congress of Physical Therapy Will hold its twenty-third annual scientific and clinical session on September 6-9, at the Hotel Statler, Cleveland. Annual instruction courses will be held in the mornings and the scientific and clinical sessions will be given on the remaining portions of these days and evenings. All of these sessions will be open to the members of the regular medical profession and their qualified aids. This should be an especially interesting meeting as physical therapy plays an important part in rehabilitation which is so much in the spot light today. For information address the American Congress of Physical Therapy, 30 North Michigan Ave., Chicago 2, Ill.

CASE REPORT OF MATERNAL DEATH

MATERNAL HEALTH COMMITTEE,
MEDICAL SOCIETY OF VIRGINIA

The patient was a thirty-one year old multipara who had had five previous normal deliveries. There was no prenatal care during the present pregnancy, and she was not seen by a physician until she had been in labor for two days. The physician was called on the second day of labor, when the membranes ruptured and the cord prolapsed. At the time of arrival of the physician the patient was found exhausted with a rapid pulse and a non-pulsating prolapsed cord. The cervix was three fingers dilated and thick. The patient was given morphine, gr. ¼, and sent to a hospital.

At the time of admission to the hospital, the patient seemed acutely ill and complained of severe abdominal pain. Temperature 97. Blood pressure 108. Respirations 28. A transverse presentation was diagnosed. One hour after admission a stillborn female infant was delivered by version and extraction under chloroform anesthesia. The placenta delivered spontaneously five minutes later. The version was done quickly and without difficulty. There were no lacerations and no excessive blood loss. Sulfathiazole was inserted in the cervix, and pituitrin and coramine given. The patient was in shock, and pantopon, glucose and oxygen were administered. She died three hours after delivery. No autopsy was performed and the cause of death is given as "obstetrical shock".

COMMENT

This case has been classified as a preventable obstetrical death because of the total absence of prenatal care and the failure to obtain medical attention during the first two days of labor. During this time the patient was attended by a midwife. Examination at the onset of labor would have shown the transverse presentation and the delivery could have been planned accordingly. The outcome for both the mother and baby in transverse presentation seems best when delivery is by Cesarean section, but this decision must be made and the operation performed just at or before the onset of labor. After labor has progressed, the membranes have ruptured, and an arm has prolapsed into the vagina, then the safe period for abdominal delivery has long since passed, and the delivery must be accomplished through the vagina. Even the extraperitoneal types of Cesarean section are not well suited for the delivery of transverse presentations with a shoulder impacted in the superior strait of the pelvis, because of the difficulty in turning and delivering the child through the low extraperitoneal uterine incision. Internal Podalic version, followed by breech extraction after full cervical dilatation, is the method commonly employed for delivery of the transversely presenting child. If this can be accomplished before the membranes have ruptured or shortly thereafter, before all of the fluid has escaped, the version may be a reasonably simple procedure, while on the other hand if the amniotic fluid has escaped, and the uterus is tightly contracted around the child, version may be extremely difficult and hazardous. Under such circumstances where version is accomplished quickly and without difficulty, as in the present case under consideration, it may reasonably be assumed that the ease of the version was due to a rupture of the uterus. Version under these circumstances requires deep anesthesia for uterine relaxation, and occasionally when the child is dead, disarticulation of the prolapsed arm at the shoulder joint, makes the version somewhat less difficult. With a dead child, and a tightly contracted uterus, so that version seems too hazardous, decapitation should be done. Technically, decapitation too may offer considerable difficulties, but it is the procedure of choice in the so-called neglected transverse presentation; that is, dead child, cervix fully dilated, membranes ruptured, and uterus tightly contracted around the baby with a shoulder impacted in the pelvis and an arm prolapsed into or through the vagina.

In the present case the patient was obviously exhausted at the time of admission and quite likely the uterus was already ruptured at that time, as suggested by the severe abdominal pain, rapid weak pulse, and acutely ill appearance. Under these circumstances, fluids, glucose, sedatives, plasma and whole blood may have been of more value than immediate delivery. If the uterus was ruptured, which seems most likely, after the above preoperative prep-

arations, hysterectomy should have been performed. After the delivery by version and extraction, the presence of a rupture could have been determined by intrauterine palpation, with subsequent hysterectomy if uterine lacerations were present. Even with copious blood transfusions, sulfonamides and hysterectomy the mortality of uterine rupture during labor is quite high. If this patient had had competent obstetrical attention in the latter weeks of pregnancy and at the onset of labor, the death would most likely have been prevented. While the course pursued after admission to the hospital may be seriously questioned (failure to first treat shock and to diagnose or rule out uterine rupture, and treat it if present), it is doubtful if a different course then would have appreciably altered the outcome.

MENTAL HYGIENE.

The Mental Hygiene Society of Virginia

Held its annual meeting at Roanoke on April 28th. The program was held at the Hotel Roanoke with Dr. Joseph E. Barrett, president, presiding and Dr. Howard R. Masters as program chairman. The annual meeting and luncheon was followed by a program on "Security and Rehabilitation in War Time", with the following participating:

Luther E. Woodward, Ph.D., Field Consultant, Rehabilitation Division, National Committee for Mental Hygiene, New York City.

Dr. O. B. Darden, Associate Professor of Neuropsychiatry, Medical College of Virginia.

William H. Stauffer, Ph.D., Commissioner of Public Welfare, Virginia Department of Public Welfare.

Captain Charles A. Spangler, MC., Army of the United States, Fort Eustis.

At 8 o'clock, the Society presented a general program with Dr. Barrett presiding. Lt. Commander Leslie B. Hohman, MC., USNR., Naval Hospital, Portsmouth; Associate in Psychiatry, Johns Hopkins University Medical School, spoke on "The Adolescent During War Time".

Motion pictures were shown on "Psychiatry in Action" (sound picture on the rehabilitation of the psychiatric war casualties), and "Life Begins Again" (sound picture on the rehabilitation of men injured in industry).

Officers of this Society are: President, Dr. Joseph E. Barrett; vice-president, William Shands Meacham; secretary, Dr. Rex Blankinship; treasurer, James C. Faw; membership chairman, Dr. Joseph R. Blalock; finance chairman, Dr. R. Finley Gayle, Jr.; legislative chairman, Dr. O. B. Darden; and executive secretary, F. W. Gwaltney. The Executive Committee is composed of Dr. Barrett, Mr. Faw, Dr. Blankinship, Dr. Gayle, Mr. Meacham, Dr. Howard R. Masters and Dr. J. J. Scherer.

The Mental Hygiene Society has, since its organization on February 19, 1937, pointed the way to a more adequate mental health program for our State. In the short space of its six years of history much thinking and planning has been done, and the achievements can be considered as remarkable, especially in the matter of securing suitable legislation and in some phases of organization. Enough legislation is now on the statute books to make it possible to carry out a most progressive mental hygiene program. It would seem to depend now on the desire and initiative of those who have it in their power to carry out the intents of these statutes; and on the resources both in the way of personnel, finances, and ideas which may be at their command. The adequacy of finances and their continuation as such for the future depend to a considerable extent on how well those which are now available are used.

The mental hygiene movement as represented by the Mental Hygiene Society of Virginia, to be effective must take the lead in the promotion and development of a new spirit. Its teachings and principles cut across nearly every section of the social strata. Its purpose is to promote freedom of mind and make possible a greater degree of happiness in everyday living. It should be an aid to education, religion and all forms of social welfare and linked closely with these groups for a State-wide, coordinated effort to make Virginia a good place to live in for all its citizens.

MILITARY MEDICINE

The following letter has been received from Dr. David B. Stuart of Roanoke. We would like to hear from more of our members in the Service. How about it? We know you all have had some interesting experiences which could be published.

MAY 1, 1944.

Perhaps I was in a bit of whimsical humor yesterday when I received a card inviting me to attend the meeting of the Society in October to be held in Richmond. The last line suggesting that it would be a good time to "plan" a "vacation" appealed to me particularly, as how we "over here" would love to plan such a vacation, if ours were the planning.

Seriously though it made me realize how out of touch I had allowed you to become, and I thought I had written you before to help you keep the records straight, but must have allowed it to escape my attention. My present address is as below:

Major David B Stuart, M. C., O-298095,
44th Hospital Train,
APO 813, c/o PM, New York City.

I was made a Major before leaving Texas last year, and was put in command of a Hospital Train which I brought overseas first to —— and then later to —— where we have been stationed for sometime. Wish I could tell you all that I have done, am doing and "have been done to" for it would make an interesting story, but the Army is "sorta" particular as to just what we say.

Have run across quite a number of Doctors from Virginia and several from the good Town of Roanoke.

Hope to see you in October but am afraid it wont be in the year 1944.

DAVID B. STUART.

Virginia Doctors in Service
Supplement 7

This is the Seventh Supplement to the list of Virginia Doctors in Service, the original list appearing in the July 1942 *Monthly*, with supplements in September and October 1942, January, April and September 1943, and February 1944. Names are given in alphabetical order with home addresses in view of constant changes in location and rank.

The *Monthly* will appreciate it if any reader will advise of omissions that they may be included in a future supplement.

MEMBERS OF MEDICAL SOCIETY OF VIRGINIA

Dr. Lyle E. Delap, Radford.
Dr. William Minor Deyerle, Richmond.
Dr. Douglass D. Fear, Roanoke.
Dr. James B. Funkhouser, Marion.
Dr. Edward E. Haddock, Richmond.
Dr. Richard F. Hawkins, Radford.
Dr. Horace D. Hoskins, Lynchburg.
Dr. Hal S. Johnson, Patterson.
Dr. C. E. Keefer, Lynchburg.
Dr. A. C. Ray, Jr., Ashland.
Dr. James P. Williams, Richlands.

NON-MEMBERS

Dr. Elton M. Alrich, University.
Dr. Walter P. Barnes, University.
Dr. David Joseph Barton, Roanoke.
Dr. Harry J. Bartron, Jr., Roanoke.
Dr. Charles Porter Blunt, III, Lynchburg.
Dr. Louis Alfred Cibelli, Roanoke.
Dr. Simon Coren, Petersburg.
Dr. Jean DesRochers, Roanoke.
Dr. George E. Eward, Richmond.
Dr. Joseph Edwin Faingold, Roanoke.
Dr. Michael Ronald Frisch, Newport News.
Dr. Julius J. Gibbons, Jr., Richmond.
Dr. James Burnett Gilbert, Richmond.
Dr. Fleming W. Gill, Richmond.
Dr. Ovidio J. Giovanelli, Radford.
Dr. R. Kennon Hancock, Charlottesville.
Dr. Haywood Northrop Hill, Richmond.
Dr. Charlton G. Holland, Jr., Danville.
Dr. Arthur Klein, Richmond.
Dr. Melvin B. Lambreth, Jr., Richmond.
Dr. Donald Wayne Linck, Charlottesville.
Dr. Thomas Francis McGough, Pulaski.
Dr. Edward Thomas McKee, Norfolk.
Dr. Louis J. Manhoff, Jr., Richmond.
Dr. William E. Moody, Charlottesville.
Dr. Eric Francis D. Owen, Hooes.
Dr. Francis Xavier, Paletta, University.
Dr. Charles R. Riley, Richmond.
Dr. Elmer S. Robertson, Richmond.
Dr. Samuel H. Ross, Roanoke.
Dr. Charles Lester Salmon, Jr., Richmond.
Dr. Thomas Scarlett, Harrisonburg.
Dr. Percy E. Schools, Jr., Richmond.
Dr. E. Ling Shiuh, Richmond.
Dr. Philip Laub Shultz, University.
Dr. James Avon Smith, Richmond.
Dr. H. U. Stephenson, Jr., Richmond.
Dr. Joshua P. Sutherland, Haysi.
Dr. Herman Isidor Switkes, Kecoughtan.
Dr. Michael Chester Tavenner, Norfolk.
Dr. Smith Davis Taylor, Roanoke.
Dr. John Kirk Train, Charlottesville.
Dr. James A. Thweatt, Petersburg.
Dr. Jack Lankford Ulmer, Richmond.
Dr. Louis F Verdel, Roanoke.
Dr. Harold E. Wager, Charlottesville.
Dr. Paul Weitz, Roanoke.
Dr. Mark B. M. Williams, Richmond.
Dr. Robert M. Wilson, Richmond.

Dr. Reuben F. Wohlford, Roanoke.
Dr. Frederick G. Woodson, Charlottesville.

Promotions in the Service.

Promotions of Virginia doctors in the Services have been noted as follows:

TO COMMANDER:

Dr. James N. Williams, Richmond.

TO MAJOR:

Dr. Hugh B. Brown, Jr., Draper.
Dr. Thomas E. Painter, Pulaski.
Dr. David B. Stuart, Roanoke.
Dr. James W. Tankard, Hilton Village.

TO CAPTAIN:

Dr. John F. Gayle, Newport News.

PUBLIC HEALTH

I. C. RIGGIN, M.D.,
State Health Commissioner of Virginia

The report of the Bureau of Communicable Diseases of the State Department of Health for April, 1944, as compared with the same month in 1943, and for the period of January through April, 1944, compared with the same period in 1943, follows:

	Apr. 1944	Apr. 1943	Jan.-Apr. 1944	Jan.-Apr. 1943
Typhoid and Paratyphoid Fever	16	8	32	44
Diarrhea and Dysentery	205	99	1,014	420
Measles	4,528	2,087	13,156	6,147
Scarlet Fever	577	167	1,494	778
Diphtheria	26	15	88	138
Poliomyelitis	2	0	4	10
Meningitis	55	107	306	492
Undulant Fever	2	3	12	9
Rocky Mountain Spotted Fever	1	0	2	1
Tularemia	0	1	16	24

MORTALITY AMONG THE MIDDLE-AGED

Demands upon adults between 45 and 65 years of age have become increasingly great in the past two years due to the gearing of the nation to war production. The health of the population of this age group, constituting as it does a large proportion of persons in executive and managerial positions and of skilled workers, is of especial importance to war industry.

Between the ages of 45 and 65 years, mortality rates begin to increase rapidly. During the latest census year, 1940, the death rate in Virginia for the age group 45 to 55 years was 13.2 per cent per 1,000 population, and for the group 55 to 65 years was 25.8. The general time trend in mortality for this sector of the population is slightly downward, although year-to-year variations are somewhat wide. The sex differential is relatively large—the rate for males of this group in 1940 exceeding the rate for females by 38 per cent.

Deaths among persons between the ages of 45 and 65 years in the State in 1943 totaled 7,910, among 28,707 of all ages. Seven major causes were responsible for 80 per cent of deaths among the middle-aged. Diseases of the heart accounted for the largest number, 2,450, or 31 per cent of the total. Next in numerical order came intracranial lesions of vascular origin (including cerebral hemorrhage, embolism, thrombosis, softening, and paralysis of other and unspecified types) which caused 1,047 deaths (13 per cent). Cancer ranked third, with 987 deaths (12 per cent). Nephritis, with 755 deaths (10 per cent) was fourth; then came pneumonia and influenza with 383 deaths (5 per cent). Tuberculosis (all forms), in the sixth place, numbered 359 (5 per cent). Deaths due to accidents of all types came seventh with 355 deaths (4 per cent). The seven principal causes of death twenty years ago were the same as those in 1943. The relative rank of the causes, however, showed one difference—cancer and nephritis in the third and fourth places, respectively, in 1943 were in reverse positions in 1924.

The cardiovascular-renal diseases constitute the chief health problem of the middle-aged. Despite a downward movement in the death rate for this group of causes during the past two years, it is possible that the stress and strain of maintaining production schedules during the war years may result in higher mortality among those in the 45 to 65 year age-bracket. Statistics in Virginia for the first quarter of the year 1944 indicate an increasing death rate for the diseases of the cardiovascular-renal system.

WOMAN'S AUXILIARY
to the
MEDICAL SOCIETY OF VIRGINIA

President—MRS. W. CLYDE WEST, Alexandria.
President-Elect—MRS. PAUL C. PEARSON, Turpin.
Recording Secretary—MRS. C. C. SMITH, Norfolk.
Corresponding Secretary—MRS. N. G. SCHUMAN, Alexandria.
Treasurer—MRS. REUBEN F. SIMMS, Richmond.
Chairman, Press and Publicity—MRS. E. LATANE FLANAGAN, Richmond.

The "Bulletin"

Of the Woman's Auxiliary to the American Medical Association should have been read and used by members of the Association to a greater extent this year than ever before because of the excellent articles on "The Wagner-Murray-Dingell Bill", carried in each issue. All Auxiliaries can urge their members to avail themselves of this material and aid themselves in discussing the bill freely and intelligently. The December 1943 issue gives a digest of the Wagner Bill and the March 1944 carries an article on "The Layman's Viewpoint".

A new service carried by the *Bulletin* is the names and addresses of auxiliary members stationed with their husbands in the armed forces. They are listed by states in which they are now residing and it is suggested that local auxiliaries extend the courtesy of their meetings to those members now residing in their state.

Our part in the community health programs and coming articles in *Hygeia* are other aids carried in the *Bulletin* to help members in their efforts to aid their husbands.

The next issue of the *Bulletin* will carry a detailed program of the twenty-second annual meeting of the Auxiliary to be held in Chicago, June 12-15, at the Hotel Knickerbocker.

Perhaps next year the Auxiliary Presidents will themselves realize the value of the *Bulletin* and try to interest more members in subscribing.

SARAH D. ENGH (MRS. O. ANDERSON)
Chairman, Bulletin.

Mid-Tidewater Auxiliary.

The regular quarterly meeting of this Auxiliary was held on April 25th in the home of Mrs. W. S. Cox of West Point, with Mrs. Hawes Campbell, president, presiding. Mrs. Paul Pearson, acting program chairman, had arranged an impressive program in observance of Doctor's Day and presented a lovely tribute in memory of Dr. Hawes Campbell. Mrs. James W. Smith read a prayer entitled "The Doctor". Mrs. W. S. Cox read an interesting article from the VIRGINIA MEDICAL MONTHLY relative to the many accomplishments of our State Medical Society President, Dr. Bowyer.

Mrs. Campbell then presented Mrs. Fred Alexander, Educational Director and State Commander, Women's Field Army for Cancer Control, who gave much valuable information and many suggestions as to how the public can be educated to help eradicate this most horrible disease. She told of the progress being made in the various counties and also told of the fine work of one of King William's farmer doctors—namely Dr. Roscoe Spencer.

The Auxiliary was happy to have as guests Mrs. Hudnall Ware, Mrs. Payne and Mrs. Alexander, of Richmond, and Miss Parker of Providence Forge. After a delicious lunch as guests of the doctors at the York Inn, the ladies were taken on a tour to see the gardens at Chelsea and Romancoke plantations.

VIRGINIA M. PEARSON,
Publicity Chairman.

BOOK ANNOUNCEMENTS

Books received for review are promptly acknowledged in this column. In most cases, reviews will be published shortly after the acknowledgement of receipt. However, we assume no obligation in return for the courtesy of those sending us same.

Small Community Hospitals. By HENRY J. SOUTHMAYD, Director, Division of Rural Hospitals, The Commonwealth Fund. And GEDDES SMITH, Associate, The Commonwealth Fund. New York., The Commonwealth Fund. 1944. 182 pages. Cloth. Price $2.00.

Synopsis of Diseases of the Heart and Arteries. By GEORGE R. HERRMANN, M.S., M.D., Ph.D., F.A.C.P., Professor of Medicine, University of Texas; Director of the Cardiovascular Service, John Sealy Hospital; Consultant in Vascular Diseases, U. S. Marine Hospital. Third Edition. St. Louis, The C. V. Mosby Company. 1944. 516 pages. With 103 Text Illustrations and 4 Color Plates. Cloth. Price $5.00.

Synopsis of Neuropsychiatry. By LOWELL S. SELLING, Sc.M., M.D., Ph.D., Dr. P. H., Director, Psychopathic Clinic, Recorder's Court, Detroit, Mich.; Associate Attending Neuropsychiatrist, Eloise Hospital; Adjunct Attending Neuropsychiatrist, Harper Hospital. St. Louis, The C. V. Mosby Company. 1944. 500 pages. Cloth. Price $5.00.

Industrial Ophthalmology. By HEDWIG S. KUHN, Hammond, Indiana. St. Louis, The C. V. Mosby Company. 1944. 294 pages. With 114 Text Illustrations Including 2 Color Plates. Cloth. Price $6.50.

Practical Malaria Control. A Handbook for Field Workers. By CARL E. M. GUNTHER, M.D., B.S., D.T.M. (Sidney), Field Medical Officer, Bulolo Gold Dredging Ltd., Territory of New Guinea, at present with the Australian Medical Corps. Foreword by Prof. Harvey Sutton, O.B.E., M.D., F.R.A.C.P., B.Sc., D.P.H., F.R.San.I. Philosophical Library, New York. 1944. 91 pages. Cloth. Price $2.50.

Fundamentals of Psychiatry. By EDWARD A. STRECKER, M.D., Sc.D., F.A.C.P., Professor of Psychiatry and Chairman of the Department, Undergraduate School of Medicine, University of Pennsylvania; Psychiatrist to the Pennsylvania Hospital; Attending Psychiatrist, Psychopathic Division, Philadelphia General Hospital; etc. Second Edition. Philadelphia, J. B. Lippincott Company. 1944. xviii-219 pages. 15 illustrations. Cloth. Price $3.00.

Virus Diseases in Man, Animal and Plant. By GUSTAV SEIFFERT. A Survey and Reports Covering the Major Research Work Done During the Last Decade. Philosophical Library, New York. 1944. 332 Pages. Cloth. Price $5.00.

The Nature and Treatment of Mental Disorders. By DOM THOMAS VERNER MOORE, O.S.B., Ph.D., M.D., Professor of Psychology and Psychiatry, Catholic University of America. Foreword by Edward A. Strecker, M.D., Professor of Psychiatry, Graduate and Undergraduate Schools of Medicine, University of Pennsylvania. Grune & Stratton. New York. 1943. 312 pages. Cloth. Price $4.00.

This treatise on clinical psychiatry has been well presented. The author offers much practical material from his accumulated clinical experience.

The book offers many advantages to the reader. It describes many interesting case reports. It deviates from the theoretical, boring conglomeration of phrases that force the reader to desire to skip through its pages. The author maintains interest from beginning to end. This is as it should be. Psychiatry is so presented that one readily discovers the author's objective; it is an art or a science with its ability to understand and meet the needs of those who are mentally sick.

Dr. Moore's treatise clearly presents the sound principles of the various major and minor psychoses. He deals with each type as an entity that needs sound treatment like any physical disease that we may encounter. The author leads us away from mere custodial care and soundly offers the case reports as to the various concepts of mental disorders; the fundamental principles of psychopathology. He studies the individual and the family in their mental distress. The problem is analyzed socially, psychologically, and from a psychiatric basis. Again, this is as it should be.

This treatise will be helpful to psychiatrists, psychologists, physicians, medical students and to psychiatric nurses and social workers. I congratulate Dr. Moore on his book that is timely with the increasing needs of more sound understanding of the mentally sick. Namely, study the patients systematically, treat to the best of our knowledge and cast aside the old traditional custodial care.

VINCENT E. LASCARA, M.D.

Tuberculosis of the Ear, Nose and Throat: Including the Larynx, the Trachea, and the Bronchi. MERVIN C. MYERSON, M.D., New York City. Springfield, Ill. and Baltimore, Md., Charles C. Thomas. 1944. 291 pages. 89 illustrations. Price $5.50.

In an excellent monograph Myerson has described tuberculous lesions of the ear, nose, throat, trachea, bronchi and esophagus that have been encountered in a study of more than ten thousand patients suffering from tuberculosis.

The book is satisfying in all respects.

The arrangement of material, method of presentation and profuse illustrations all serve to provide adequate descriptions of almost all tuberculous lesions observed by the oto-laryngologist and broncho-esophagologist.

The author's broad experience has provided him with an understanding of tuberculosis that is shared rarely by other specialists in his field. He recognizes tuberculosis as primarily a constitutional disease and the conservative attitude that he has assumed in treating local manifestations of this infection will be lauded by phthisiologists.

Myerson's experience in the study of tuberculous tracheo-bronchitis is unique and it is refreshing to have his opinion that bronchoscopy should not be routinely employed in all patients having pulmonary tuberculosis but should be reserved for those in whom an obstructing lesion is suspected or for whom collapse therapy is contemplated.

As usual the publisher has done a superb job in the preparation of this most attractive volume.

P. P V.

VIRGINIA MEDICAL MONTHLY

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(Founded by Landon B. Edwards, M. D., April, 1874)

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Editor Emeritus

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All correspondence regarding editorial matter, original articles, and policy should be directed to the Editor. Questions relating to subscription rates, advertising, etc., should be addressed to the Business Manager, 1200 East Clay Street, Richmond 19, Virginia. The MONTHLY is not reponsible for the opinions and statements of its contributors. All advertisements are accepted subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association. Annual Subscription, $2.00. Single copies 25c.

VOL. 71 JUNE, 1944 No. 6

The Synthesis of Quinine

THE synthesis of quinine by Woodward and Doering adds a new chapter to the long history of this noble drug. Doctors have always thought highly of quinine. It is one of the few drugs with which a doctor could really do things. It was our first specific remedy, and a list of specifics is even now all too short.

One can learn much from the history of quinine, not only in medicine but also in big business and politics. When it was first used is unknown. The natives of Peru knew of the virtues of the "bark" before the white man came to America in search for gold. It is a highlight in folklore therapeutics equalling that of cowpox and digitalis and ephedrine. Jenner proved the tradition of the dairy maids of Gloucestershire about the protective power of cowpox, and Withering that of the wise women about Manchester in regard to digitalis and dropsy, but the sponsor for the quinine myth is unknown. The tree was named for the Countess of Chinchon who was said to have been cured by the "bark", but even that is disputed. It was first mentioned in European medical literature in 1643 by Herman van der Heyden, a Belgian. For the next two hundred years it was the only effective remedy for the world's most widely spread disease. Many other uses were found for it in medicine, and even in the arts. It was extensively used in producing a light polarizing material.

The supply of the South American bark began to be inadequate in 1850. The British and Dutch governments attempted to grow cinchona trees in India and Java, but the plantations were failures because the trees they grew had a very low quinine content. In 1865 Ledger, exploring in the Andes, selected a type of cinchona tree that he considered to have the highest quinine content. He sold the Dutch government one pound of seed from this type. The trees in Java from this batch of seed in 1941 produced over one thousand tons of quinine. The venture was so successful that all other production became unprofitable. As so often happens when all the eggs are in

one basket, the basket was upset and now the civilized world has no source of supply of this valuable drug.

The highlights in the chemical history of quinine are as follows: In 1820 quinine was isolated from the cinchona bark for the first time. This was done by two French chemists, Pelletier and Caventou. In 1853 Pasteur made quinotoxine from quinine. This had no practical value at the time, but merely illustrated the famous quotation from Benjamin Franklin that Pasteur himself once used, i. e., that a scientific fact was like a newborn baby, you never can tell what it will grow up to be. In 1855 a German chemist, Strecker, determined the number of atoms of carbon, hydrogen, nitrogen, and oxygen that were present in the quinine molecule. The next year William Henry Perkin, later Sir William, attempted to synthesize quinine. He failed to make quinine but produced instead the dye, mauve. He recognized the importance of his discovery and built a factory—the first coal tar factory—for the production of the dye, thus starting the organic chemistry industry.

In 1871 quinotoxine, previously produced from quinine by Pasteur, was isolated from cinchona bark by Howard. In 1908 Rabe working on formulae developed by Koenigs determined the molecular structure of quinine. Ten years later he was able to resynthesize quinine from quinotoxine, the same product Pasteur had produced from quinine in 1853. In 1931 Rabe synthesized dihydroquinine which but for two extra atoms of hydrogen has the molecular structure of quinine. Finally in 1944 Woodward and Doering working in the Polaroid laboratories succeeded in synthesizing quinotoxine. Their problem was then solved, for then they merely had to repeat Rabe's work in order to have made the total synthesis of quinine. This scientific achievement is still like a newborn babe; whether it becomes useful depends upon a number of factors. One of the last steps in the synthesis results in two isomers, one of which is quinine and the other is quinine's mirror image. The latter is an entirely new substance that does not exist in nature. No one knows what the properties are. If it is found to have the same therapeutic properties that quinine has, it would not be necessary to separate the isomers, and the combined anti-malarial substances would be easier to produce, and could probably be manufactured on a commercial basis.

Finally, this first rate achievement brings to mind the discussion that has been going on for some years about the conditions best suited to stimulate investigation. There are some who argue that those with a gift of scientific curiosity should not be burdened with executive and teaching duties. Others maintain that contact with scholars and other investigators is invaluable. We doubt if there is any one answer. Some work best in isolation and others need the inspiration that comes from the association with other workers. If an investigator has a problem, the ways and means of solving it are usually found, whether it be in an university, a foundation, or a big corporation. The scientific fact that is discovered may have no practical value, but the investigator and those who have made the investigation possible have done the world a distinct service.

Menstrual Toxin

THE taboos in regard to menstruating women are legion. They have existed in all times. All primitive people have them in one form or another. Among the American Indians, squaws at the time of menstrual purgation were obliged to seclude themselves and in many instances to occupy isolated lodges. In all tribes they were forbidden to prepare food for anyone save themselves. Were a menstruating women to step astride a rifle, a bow or a lance, the weapon would become useless. In Australia native women during this season are forbidden to touch anything that men use. Aristotle

said that the very look of a menstruating woman would take the polish out of a mirror, and the next person looking it in would be bewitched. Many of the taboos involve growing things, such as not allowing a menstruating woman to walk across a field of sprouting grain. The failure of bread to rise when kneaded by a menstruating woman is a common belief among Southern darkies. In England it was believed that curing of meats was not successful if handled by a woman who was unwell. An old Russian custom discouraged the pickling of cucumbers or the making of sauerkraut by such individuals, and the latter part of this belief is widespread in this country. In France women who are unwell are not admitted in sugar refineries where the syrup is boiling or the sugar is being bleached on account of the belief that their touch would discolor the product. Winemakers look with disfavor on the presence of such persons. In the Far East menstruating women are not allowed to pick poppyheads and prepare opium. Pliny's writings concerning the poison of menstruation and its effect on seeds, garden plants, etc., are well known. He says, "On the approach of a woman in this state, must will become sour, seeds which are touched by her become sterile, grass withers away, garden plants are parched up, and the fruit will fall from the tree beneath which she sits." On the other hand, in Cappadocia menstruating women were walked about the fields to preserve the vegetation from worms and caterpillars. We have always thought of such taboos as mere superstitions, but the recent work of Macht and others gives a scientific basis for such beliefs. Once again folk-medicine has been proved to contain a germ of truth as did the superstition that an attack of cowpox afforded protection against smallpox, or that foxglove cured dropsy. For fifty centuries the Chinese have used Ma Huang as a diaphoretic, antipyretic, circulatory stimulant, and respiratory sedative. The western world now uses it extensively under the name ephedrine.

In 1920 Bela Schick's experiments with cut flowers suggested that there was even more contamination from the touch of a menstruating woman than superstition indicated. Macht and Livingston by phytopharmacologic methods found that there is in the blood serum, blood plasma, saliva, sweat, tears, milk, and other secretions of a menstruating woman a toxic substance which markedly inhibits root growth of *Lupinus albus* seedlings. Other work followed which Macht in a recent paper (Am. J. M. Sc. 206:281, 1943) fully reviews. Rahn and his coworkers have shown that menotoxin has an inhibitory action upon yeast. Animal tissue is also sensitive to the menstrual toxin. Borsarelli found that menstrual serum was exceedingly poisonous for larvae of *Bufo vulgaris*. Macht and Lubin showed that menstrual serum is more toxic than normal blood for goldfish and paramecia. Macht and Davis showed that small doses of menotoxin profoundly depressed the neuromuscular system of rats as shown by the maze test and the rope walking and rope climbing tests. Macht described a vasoconstricting effect of local application of menstrual serum to genitalia of male cats and rabbits. Almost unbelievable are the results reported by Christiansen, Rahn, Barnes, and Ferguson who showed that yeast cells can be inhibited by emanations or radiations from the bodies of menstruating women. Various parts of the body such as the fingertips and even the eyes give off these radiations which will pass through quartz but not through glass.

The chemical nature of menotoxin is not yet completely determined. The various pharmacologic and biochemical tests, particularly the phytopharmacologic test indicate a close relationship of menotoxin and cholesterin or more strictly speaking, oxycholesterin. Furthermore, Rahn has shown that cholesterin has inhibitory effects on yeast similar to those he had observed in his radiologic tests on menstruating women.

Societies

Roanoke Academy of Medicine.

At the last meeting of the Academy, the following officers were elected for the ensuing year and will take office at the October meeting: Dr. Linwood D. Keyser, president; Dr. B. P. Seward and Dr. T. J. Hughes, vice-presidents; and Dr. David S. Garner, secretary-treasurer (re-elected).

The Executive Committee will include Drs. Andrew M. Groseclose, Frank A. Farmer, Fred E. Hamlin, W. L. Powell and Charles W. Dorsey.

The following were named as the Judiciary Committee: Drs. J. W. Preston, John O. Boyd, W. R. Whitman, H. B. Stone and W. W. S. Butler.

Delegates and alternates were also appointed at this time to the annual meeting of the Medical Society of Virginia in Richmond.

The Accomac County Medical Society,

At a recent meeting, elected the following as officers for the current year: President, Dr. O. R. Fletcher of Sanford; vice-president, Dr. Rooker J. White of Keller; and secretary-treasurer, Dr. James C. Doughty (re-elected) of Onancock.

The Amelia County Medical Society

Held its annual meeting on May the 11th, at which time Dr. J. M. Habel of Jetersville was elected president for the coming year, and Dr. J. L. Hamner of Mannboro was re-elected secretary-treasurer. Delegate and alternate were also named for the meeting of the State Society in October.

Norfolk County Medical Society.

On May 8th, the Society was guest of the Staff of the Naval Hospital, Portsmouth, when members of the Staff presented a Symposium on Penicillin. The following program was arranged: Uses in Surgical Infections by Dr. J. D. Wilson; Uses in Joint Infections by Dr. R. Schubert; Uses in Ear, Nose and Throat by Dr. A. T. Smith; and Uses in Medical Diseases by Dr. H. J. Fox.

On May 15th, Dr. Porter P. Vinson, professor of laryngology of the Medical College of Virginia, spoke on Diaphragmatic Hernia.

Dr. N. F. Rodman is president of this Society and Dr. Lockburn B. Scott, secretary-treasurer.

The Dickenson-Buchanan County Medical Society

Met at the Grundy Hospital on April the 19th, and after supper elected delegates and alternates to the meeting of the Medical Society of Virginia in October. Following this, a motion picture on Treatment of Diphtheria was presented. The monthly meetings of this Society are well attended. Dr. J. C. Trivett of Page is president and Dr. T. C. Sutherland of Haysi secretary-treasurer.

News

War Bond Facts and Figures.

The Fifth War Loan will begin June 12th, closing July 8th.

The goal will be $16,000,000,000, of which 6 billions will be sought from individual investors.

More than 55,000,000 Americans own at least one War Bond. That's an average of better than 1½ Bond owners for every U. S. family.

Total sales in the four War Loan drives, plus the sales of savings bonds, aggregate more than 87 billion dollars. Three weeks after Pearl Harbor it was only 2½ billions.

Individual investors purchased 32½ billions of the total—13 times more than their holdings in December 1941.

Single "E" Bonds sold—separate pieces of paper—total more than 500,000,000. That's a 38-time increase since Pearl Harbor. A half-billion "E" Bonds laid side by side would girdle the globe 2½ times. Placed one on top of the other, they would

make a pile 39½ miles high.

Sales of $25 Bonds alone have jumped to 346 million pieces. That's 69 times the number of dollar bills now in circulation.

27,000,000 Americans are now putting almost ten cents of every dollar they make into War Bonds every pay day. They're plowing back into the war effort 475 million dollars a month.

During the War Loan drives more than 5,000,000 unpaid volunteers ring doorbells and pound pavements to get their sales.

You can buy War Bonds or War Stamps in any one of one million places during the Fifth War Loan drive.

More "E" Bonds—the smaller ones for the small investors—were sold in the Fourth War Loan than ever before—69,900,000 individual transactions that brought in $3,187,000,000.

To reach this total sales of "E" Bonds averaged $63,740,000 every working day, $7,967,550 per working hour.

Putting it another way, sales of "E" Bonds during the Fourth War Loan averaged $24.56 for every man, woman and child in the nation. This was $5.35 more than the average for the Third War Loan.

Bonds are the best advertised product in history but it hasn't cost the government a cent. Private business and publications contributed the space, the time and the manpower—more than 240 million dollars worth.

Because so many people contribute their time, office space and other assistance, War Bond sales' cost to the government is only one cent for every thirty-three dollars raised.

Of every $100 Americans saved in 1943, they loaned forty-four to the government to help pay for the war.

For the Richmond Meeting

Of the Medical Society of Virginia, the following rates have been secured from local hotels:

JOHN MARSHALL HOTEL—HEADQUARTERS
(All rooms with bath.)
Single—4.00, $4.50 and $5.50.
Double—$6.00, $7.00 and $9.00.
Twin beds—$7 00, $8.00, $9.00 and $12.00.

RICHMOND HOTEL
Single with bath—$3,00, $3.50, $4.00 and $4.50.
Single without bath—$2.25 and $2.50.
Double with bath—$5.00, $5.50, $6.00 and $6.50.
Double without bath—$4.00.
Twin beds with bath—$6.00 and $8.00.
Twin beds without bath—$4 50.

MURPHY HOTEL
Single with bath—$3.00 and $3.50.
Single without bath—$2.25 and $2.50.
Double with bath—$5.00, $5.50 and $6.50.
Double without bath—$3.50 and $4.00.

WILLIAM BYRD HOTEL
Single with bath—$3.00, $3.50 and $4.00.
Single without bath—$2.50.
Double with bath—$5.50, $6.00 and $6.50.
Double without bath—$4.50.
Twin beds with bath—$6.00, $6.50, $7.00 and $7.50.
Twin beds without bath—$5 00.

JEFFERSON HOTEL
(All rooms with bath.)
Single—$3.50, $4.00, $4.50 and $5.00.
Double—$5.50 and $6.00.
Twin beds—$6.00, $7.00 and $8.00.

HOTEL RUEGER
Single with bath—$3 00-$4.00.
Single without bath—$2.50.
Double with bath—$4.00-$6.00.
Double without bath—$3.50.
Twin beds with bath—$6.00.

Owing to the large number of Service men constantly coming and going, the hotels have suggested that reservations be made in advance, stating specifically date of arrival. It is easier to cancel reservations than to make them at the hotel of choice at the last minute, so please give this your prompt attention.

The meeting promises to be an interesting one and a good attendance is expected.

McGuire General Hospital.

In the outskirts of the City of Richmond, in the county of Chesterfield, rises a new city in red brick, the McGuire General Hospital. Bearing a name which is legend in the South, McGuire, after Dr. Hunter Holmes McGuire, Medical Director of the 2nd Army Corps of the Confederacy in the War Between the States and personal physician to Gen. Stonewall Jackson, the new hospital is one of the finest of its kind in the world.

Covering 142 acres, with 70 one-to-three story buildings interconnected by continuous, enclosed corridors, its completeness is evidence of the Army Medical Department's determination to provide the maximum in care, treatment and comfort for the

inevitable military casualties of World War II.

To date, the McGuire General Hospital has not been assigned any medical specialty by the War Department. Patients coming to its doors aboard hospital trains, by ambulance, or by ships from overseas stations may have physical incapacities of any nature. The medical, surgical and dental skills and facilities are being organized to meet any medical eventualities, and the finest equipment yet devised stands ready to facilitate the work of a staff of specialists drawn from all over the United States for service at McGuire.

Many of these physicians and surgeons have had actual battlefront experience in this war and so are especially well qualified to treat the types of casualties produced by modern warfare. Aiding them and supplementing their work will be a group of experienced Army nurses, Army medical corpsmen and a body of civilian employees itself numbering close to a thousand.

At the head of this immense organization stands a surgeon, who is today in his twenty-seventh year of Army medical experience, Col. P. E. Duggins, formerly executive officer of Walter Reed General Hospital in Washington, D. C. Those who know him have no doubt that patients coming to the McGuire General Hospital will lack for naught to make their stay pleasant and their recovery speedy.

With the first patients expected in early June, the new hospital is now actually a city within itself, including, in addition to its complete medical-surgical facilities such items of interest as a gymnasium, athletic field, motion-picture theatre, auditorium, post-exchange, ice cream parlor, barber shop, beauty parlor, and a telephone exchange for calling the folks-at-home which may employ as many as twenty-five operators at one time.

Medical and surgical treatment will be supplemented by a comprehensive program of reconditioning designed to shorten convalescence and, through a planned series of recreational and educational courses, to relieve boredom and condition the minds and bodies of the patients for a return to an active life. Within this program will be contained a multitude of media and devices to restore mental and physical vigor, including occupational therapy, vocational education, orientation lectures, recreational facilities, competitive sports, etc. A patient's day at McGuire General will be a full one and will serve to offset psycho-neurotic tendencies resulting from battle experience and make the patient "come alive" again in heart as well as in body, a better man and a better citizen.

So a tradition that was born in the preceding century is extended and amplified by a new monument, and this edifice, the McGuire General Hospital, will not fall short of the many other projects and units that have in this country as well as on foreign battle-grounds, so proudly advanced the spirit and the humane purpose that is synonymous with the name of McGuire.

Dr. Horsley to be Honored.

Dr. J. Shelton Horsley, surgeon-in-charge at St. Elizabeth's Hospital, is to be awarded the honorary degree of Doctor of Science at the next commencement exercises of the Medical College of Virginia, Richmond, on September 23, according to announcement by Dr. W. T. Sanger, president of the college. Known internationally for his research in suturing arteries and reversal of arterial circulation and in surgery of the stomach and intestines, Dr. Horsley has also been one of the leaders of the South in the encouragement of research on the part of others. For his work on arterial circulation reversal he was awarded a gold medal by the Southern Medical Association and for other research a medal and several certificates of honor by the American Medical Association. He is at present the surgeon member of the National Advisory Cancer Council of six.

When Dr. Horsley was president of the Virginia Academy of Science in 1926, an endowment fund of $12,000 was raised under his leadership. Interest from this fund has been used since for grants-in-aid for scientific investigative work to promising young Virginia scientists and for one of the prizes given annually at the Academy meeting to the author of a meritorious paper reporting results of research. A prize of approximately $1,000, interest from a fund established by Dr. Horsley as a memorial to his father, is awarded every two years by a committee in the department of medicine at the University of Virginia for an outstanding thesis on research in a problem of general surgery by a University graduate in medicine or by a St. Elizabeth's former interne. He was also instrumental in the establishment of prizes for papers by staff members of the Virginia State Hospitals.

Dr. Horsley has been president of the Virginia

Academy of Science, the Southern Medical Association, the Medical Society of Virginia, the Richmond Academy of Medicine, the Association for the Study of Neoplastic Diseases, and the Virginia Cancer Foundation. He has many publications to his credit, the most recent one being on the removal of both ovaries when a breast is operated upon for cancer, in the April issue of the journal, *Surgery*. He has lately written a eugenical essay, "Breeding Better People for Peace". He is the author of several books on surgery. Commenting upon this announcement, Dr. Sanger said, "It is gratifying that our Board of Visitors has selected Dr. Horsley for our honorary degree this year. On every count he deserves it."

News from University of Virginia, Depart- of Medicine.

Dr. William F. Boos of Boston, former lecturer in Toxicology at Harvard Medical School, spoke on the subject "Experiences with Capital Poison Cases", on April 24 at the meeting of the University of Virginia Medical Society in Charlottesville.

Commencement exercises of the University of Virginia Hospital School of Nursing were held in the afternoon of April 25. Sixty-five nurses in the University of Virginia School, four affiliates from the Blue Ridge Sanatorium, and eleven affiliates from the Catawba Sanatorium were awarded certificates of graduation. The graduation address was given by Miss Agnes Ohlson, R.N. of the United United States Public Health Service.

On May 4, Dr. Arnoldo Gabladon, Chief of the Division of Malariology of Venezuela and Chairman of the Pan-American Committee on Malaria, spoke before the University of Virginia Medical Society on "Vectors of Malaria in America". He spoke the following day on the subject "Antimalarial Organization in Venezuela".

Dr. Henry B. Mulholland, Professor of the Practice of Medicine in the University of Virginia Medical School, spoke at Camp Lee on May 12 to the Medical Officers on "Chemotherapy and Respiratory Diseases". On May 13 he spoke to the Business and Professional Women's Association of the State of Virginia, meeting in Roanoke, on the subject of "Medical Care".

The John Horsley Memorial Prize in Medicine in the amount of $600, founded in 1925 by Dr. J. Shelton Horsley of Richmond, Virginia, as a memorial to his father, Mr. John Horsley of Nelson County, Virginia, was awarded at the time of the annual initiation ceremonies of the University of Virginia Chapter of Sigma Xi, on Thursday, May 11, to Dr. William Bennett Bean of the Department of Internal Medicine of the University of Cincinnati. The prize is open to all graduates of the Department of Medicine of the University of Virginia of not more than fifteen years' standing, and to former internes of St. Elizabeth's Hospital in Richmond, Virginia, under the same conditions. Dr. Bean was graduated from the Medical School of the University of Virginia in 1935. He is now on leave of absence, with the Commission of Major in the Medical Corps of the United States Army, Armored Medical Research Laboratory, Fort Knox, Kentucky. The prize was awarded for a paper on "Secondary Pellagra" by Drs. William Bennett Bean, Tom Douglas Spies, and Marion A. Blankenhorn, published in the February issue of *Medicine*.

Dr. Brown Resigns As Head of Blue Ridge Sanatorium.

On account of his health, Dr. William E. Brown has resigned as superintendent and medical director of Blue Ridge Sanatorium, effective July 1, after having held this position for twenty-three years. After a short time in private practice, he was appointed assistant physician to Catawba Sanatorium and continued his connection with that institution until his appointment to the Blue Ridge post. He was also connected with the teaching staff of the medical school of the University of Virginia. During his administration, the bed capacity at Blue Ridge Sanatorium has increased from 120 to 370 beds and the physical equipment of the institution has doubled.

Southern Medical Association.

Dr. W. T. Wootton of Hot Springs National Park, Arkansas, president of the Southern Medical Association died in a St. Louis hospital on May the 2nd, after a short illness. In accordance with the By-Laws of the Association, he has been succeeded by Dr. James A. Ryan, of Covington, Ky., who was elected vice-president at the Cincinnati meeting last year.

Dr. Walter J. Otis,

New Orleans, an alumnus of the Medical College of Virginia, has been re-elected president for the

coming year of the staff of the De Paul Sanitarium of that city, and has also been re-elected chairman of the Library Committee of the Hotel Dieu (Sisters' Hospital). He has also been asked to serve for the current year on the Judiciary Committee of the Orleans Parish Medical Society.

Dr. Joseph L. Kinzie,

After serving as Captain in the Medical Corps, A.U.S., from August 1942 to May 1943, was retired because of arthritis and returned to his home at Salem, where he practiced until March of this year. Finding it necessary to have a change of climate, he then located at Lake Wales, Florida, where he is continuing the practice of medicine.

Capt. John E. Porter, (MC) U. S. N.,

Native of Richmond and a member of the class of '15, Medical College of Virginia, has been sent to New Orleans as head of the United States Naval Hospital there. He has just completed two years of service in the South Pacific. In May 1943 he was given the legion of merit for meritorious conduct in battle for his administrative and executive ability in erecting, organizing, and operating a hospital under the most primitive of conditions for the care of sick evacuees.

The Virginia Society of Ophthalmology and Oto-Laryngology

Held its twenty-fifth annual meeting on April 29th in Lynchburg with the President, Dr. E. T. Gatewood of Richmond, presiding. Dr. John H. Dunnington of New York was guest speaker and the subject of his paper was "Complications of Cataract Extraction". The following members appeared on the program: Drs. H. S. Hedges, Thomas E. Hughes, William F. Hatcher, A. A. Burke, G. M. Maxwell, and Fletcher Woodward.

Newly elected officers are Drs. James R. Gorman, Lynchburg, President; Meade Edmunds, Petersburg, President-Elect; and Thos. E. Hughes, Richmond, Secretary-Treasurer. Richmond was selected for the next annual meeting.

MEADE EDMUNDS,
Secretary-Treasurer.

Married.

Captain William Lownder Peple, Jr., MC., AUS., Richmond, and Miss Margaret Elise Ascherfeld, Baltimore, Md., May 6th. Captain Peple is a graduate of the Medical College of Virginia, class of 1941.

Editors on Quarterly Review of Obstetrics and Gynecology.

Dr. Nicholas J. Eastman of Baltimore has been elected editor-in-chief of the Section on Obstetrics of the *Review*, and Dr. Emil H. Novak, also of Baltimore, has been elected editor-in-chief of the Section on Gynecology.

Dr. Hilmar Schmidt,

Formerly of Petersburg where he was associated with Dr. Wright Clarkson, is now connected with the Roentgenological Department of Copley Hospital at Aurora, Illinois.

Old Commissions Wanted.

The National Naval Medical Center of Bethesda, Maryland, is endeavoring to collect for its archives a complete set of commissions issued to Naval medical officers and signed by past Presidents of the United States.

There is a small nidus now at the Center and it is hoped to be able to build this up to completion. Through the Navy Department Library and the National Archives a few more have been located. If libraries or individuals have in their possession such old commissions and would be willing to turn them over to the Center, there could be no more fitting enshrinement to them than their use for this purpose.

Any one who will comply with this request should send the commissions to the Division of Publications at the above address.

New Books.

The following are recent acquisitions to the Library of the Medical College of Virginia and are available to our readers, the only cost being return postage.

Abramson, David I.—Vascular response in the extremities of man in health and disease.

Aptekar, Herbert H—Basic concepts in social case work.

Ballenger, H. C.—A manual of otology, rhinology and laryngology.

Brown, Josephine—Public relief. 1929-1939.

Canavan & Eisenhardt—Brains of 50 insane criminals: Shapes and patterns.

Coleman, L. V.—Company museums.

Crile, George W—An experimental and clinical research into certain problems relating to surgical operations.

Crile, George W.—Notes on military surgery. 1917.

Crile, George—The surgical treatment of hypertension. 1938.
Glasser, Q.—Physical foundations of radiology.
Gray, Henry—Anatomy of the human body. 24 ed. rev. 1942.
Gregory, T. C.—Condensed Chemical Dictionary. 3rd ed.
Grinker and Spiegel—War neuroses in North Africa . . . The Tunisian campaign.
Hayes, E. W.—Tuberculosis as it comes and goes.
Index Catalogue of the Library of Surgeon General's Office. v.VIII.I-J.
Leifson, Einar—Bacteriology for students of medicine and public health.
Lewin, L.—The untoward effects of drugs, a pharmacological and clinical manual. 1883.
McCaughan, J. M.—Experimental surgery: a laboratory guide for undergraduate students.
Mackintosh, J. M.—The war and mental health.
Marburg, Otto—Hydrocephalus, its symptomatology, pathology pathogenesis and treatment. 1940.
May—Manual of diseases of the eye. 1943.
Moulton. F. R. ed.—Surface chemistry.
Munoz, F. J.—The microscope and its use.
Rosenau—Preventive medicine and public health. 6th ed.
Rowland, Amy—Cleveland clinic foundation. 1938.
Schieffelin & Co.—150 years service to American health. 1944.
Seiffert—Virus diseases in man, animal and plant.
Sigerist, H. E.—Civilization and disease.
Smith, F. G.—Sulfonamide therapy in medical practice. 1944.

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Office equipment in good condition, including Short Wave Diathermy. Address "Equipment", care this journal, 1200 East Clay Street, Richmond 19, Va. (*Adv.*)

Obituaries

Dr. Robert Hunter Garthright,

For many years beloved physician of Vinton, died in a Roanoke Hospital on May 2nd, after a short illness, though his health had been failing for several months. He was a native of Henrico County, this State, and had just passed his eighty-fifth birthday. Upon completion of his academic education, he entered the Medical College of Virginia from which he received his diploma in medicine in 1885. He had been a member of the Medical Society of Virginia for nearly fifty-five years and had frequently contributed to the Virginia Medical Monthly. He was also a member of the Roanoke Academy of Medicine by which he had been honored. His wife and a daughter survive him.

Dr. William Ward Seward,

Well-known physician of Tidewater Virginia, died at his home in Surry on May 5th, following a long illness. He was seventy years of age and graduated from the Medical College of Virginia in 1897. Dr. Seward had practiced in Surry County for nearly a half a century. He was chairman of the Medical Advisory Board for Surry and Sussex Counties during World War I, and was a past president of the Post-Graduate Medical Society of Southside Virginia. Dr. Seward had been an active member of the Medical Society of Virginia for forty-six years. His wife, a son and a foster-daughter survive him.

Dr. George Simeon Fultz,

Butterworth, died May 16th following a heart attack. He was seventy years of age and a graduate of the Medical College of Virginia in 1906. Dr. Fultz was at one time located in Rockingham County but had practiced in Dinwiddie County for thirty-two years. He was a Mason and had been a member of the Medical Society of Virginia for thirty-eight years. His wife, three sons and two daughters survive him. One son is Captain George S. Fultz, Jr., of the Army Medical Corps.

Dr. Robert Garnett Bledsoe,

Locust Grove, died February 2nd, at the age of seventy-five. He was a graduate of the former University College of Medicine, Richmond, in the class of 1896. Dr. Bledsoe had been a member of the Medical Society of Virginia for forty-eight years.

Dr. Jabez Peter Hankins,

Orange, died May 7th, at the age of sixty-four. He was a native of Pittsylvania County and a graduate of the Medical College of Virginia in 1908. Dr. Hankins took an active part in civic affairs of his community and was a Mason. He had been a member of the Medical Society of Virginia for a number of years and was president of the Orange County Society. His wife and one son survive him.

Dr. Walter Herbert Cobbs,

Rocky Mount, died February 5th of cerebral hemorrhage. He was sixty-two years of age and a graduate of the Medical College of Virginia in 1908. Dr. Cobbs was formerly a member of the Medical Society of Virginia.

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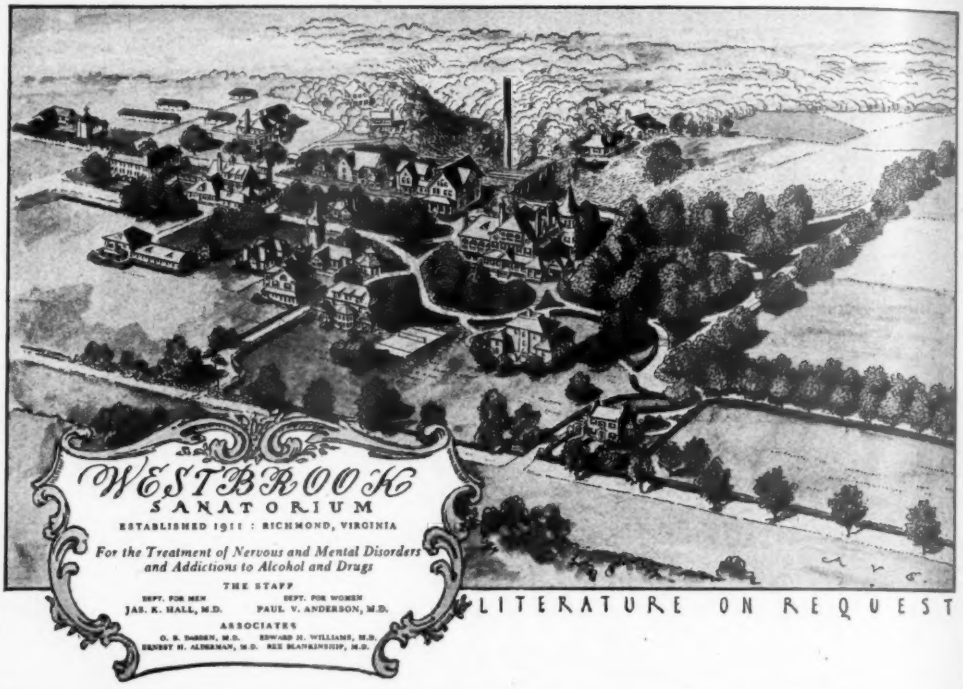

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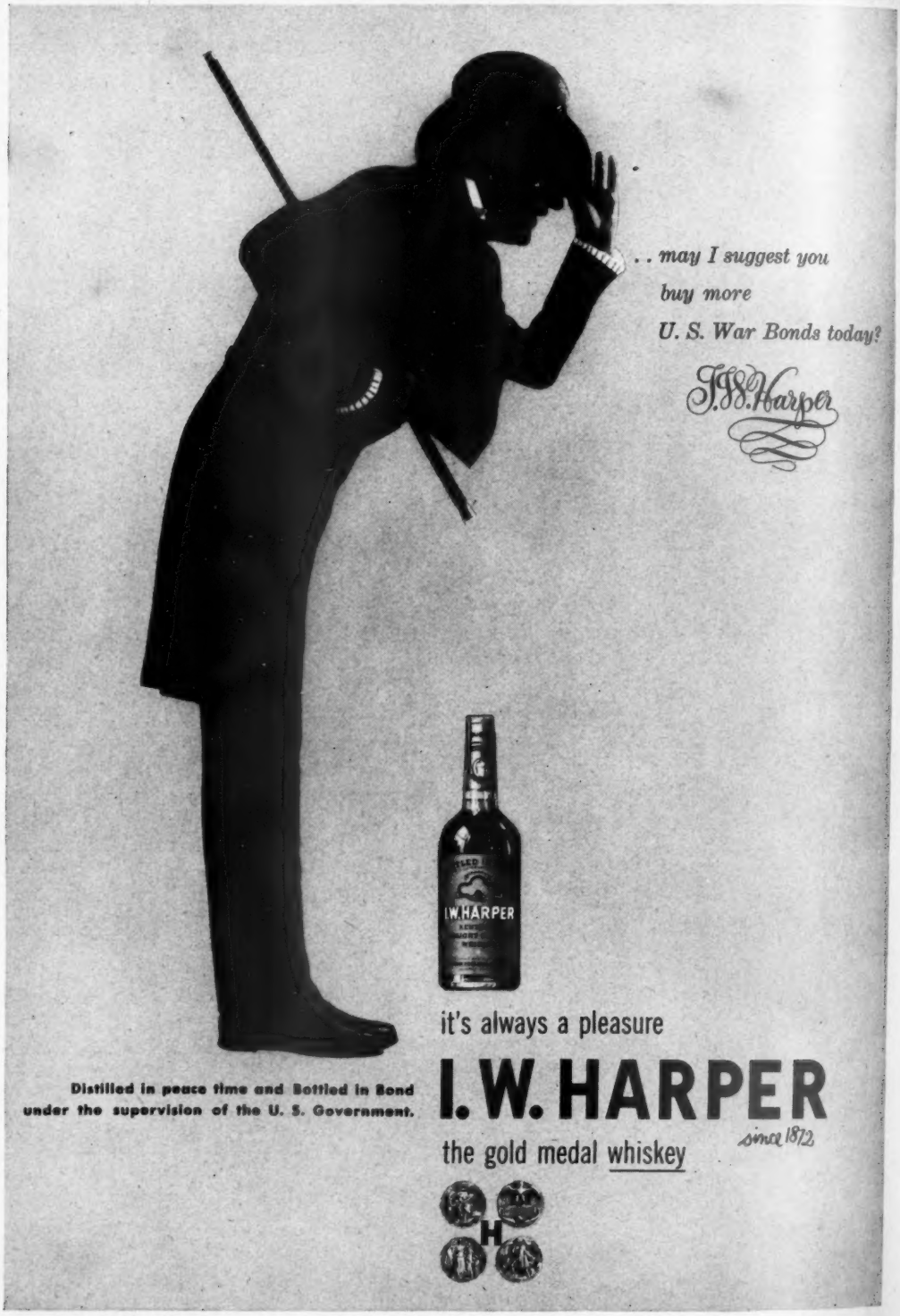
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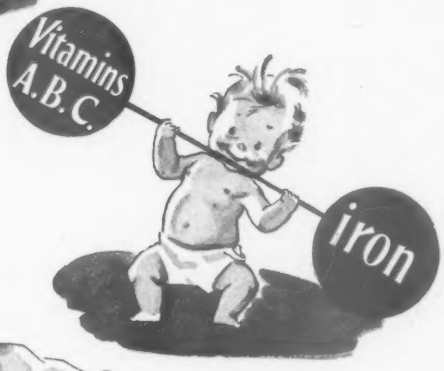

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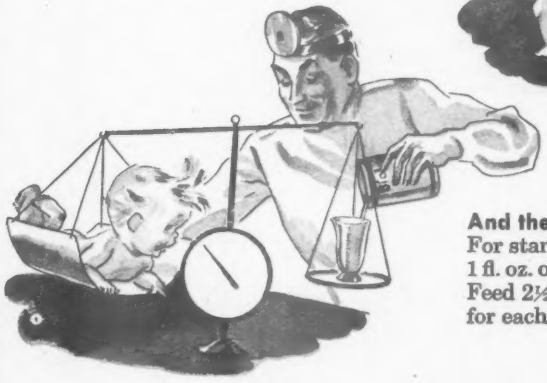

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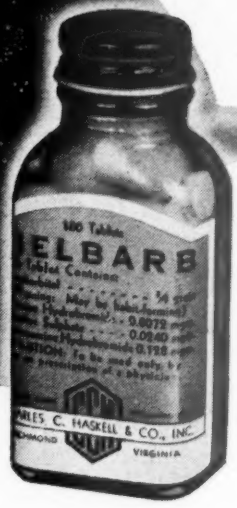

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[1] *Jl. Clin. Endocrinology* 3:648, Dec. 1943.

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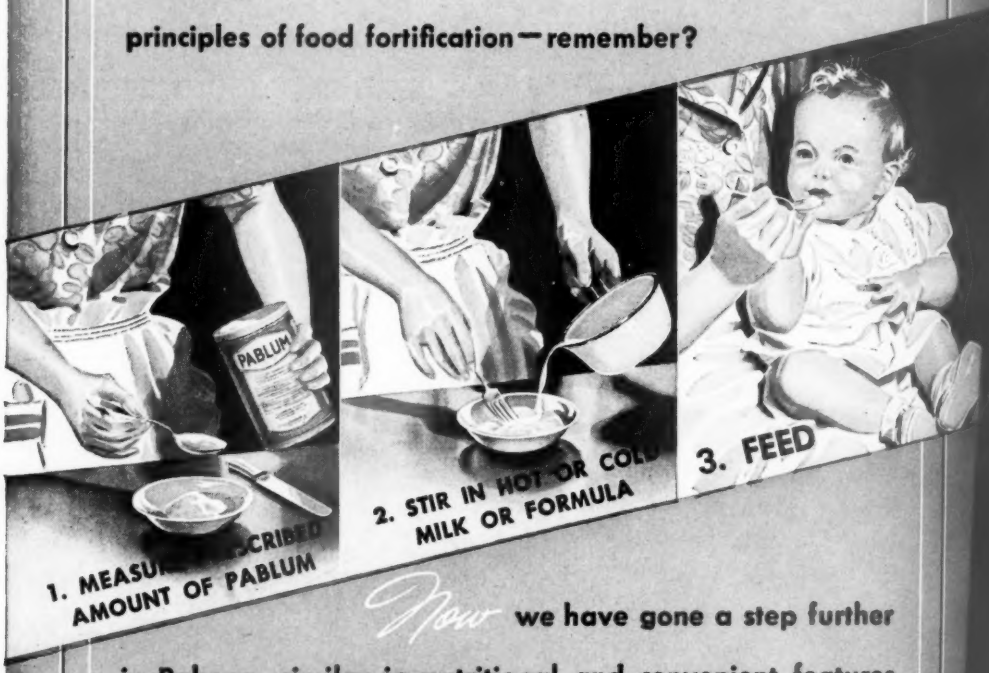

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